



Energy Investment Trends and Multi-Stakeholder Perspectives on Capital Access in Kenya

by

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A thesis submitted in partial fulfilment of the requirements for the degree of
Doctor of Philosophy

The University of Sheffield

Faculty of Social Sciences

Department of Geography

April 2025

Abstract

In the Global South, capital access for Sustainable Development Goal (SDG) 7- energy access and transition – is challenging, and Kenya is no exception. At the global stage, discussions on sustainable development and climate change often centre on access to capital in a desperate attempt to garner global collective commitment. At the national level, governments align with global agreements through policy formulation and publication of strategy documents outlining climate goals, implementation pathways and sources of finance. In Kenya, the energy sector is foregrounded as an enabler of development, critical in addressing climate change and transitioning the country to a green economy. Hence, this thesis aims to understand this challenge in Kenya's energy sector.

The theoretical framework of financialisation and the concepts of financial ecologies (actors, practices, relations) are applied to discuss investment outcomes and capital access. A mixed methods approach supported extensive and in-depth analysis of investment, interview and document datasets.

Temporally, the country's capital access has improved over time for both private and public investments. However, key issues persist: debt overwhelmingly dwarves other sources of capital, especially from international public institutions, and in private investments, it is fast closing the gap; the rarity of catalytic financing and the sharp decline of grants affect small local companies and; in the off-grid sub-sector, capital concentrates on a few large internationally linked companies. Access to capital is complex, influenced and controlled by endogenous factors (at the company level), exogenous factors (global and national), relationships, and connections; it is elusive to many small, struggling local companies.

This thesis recommends sustainable investment practices guided by six principles to address existing capital needs, gaps and outcomes: reach, relevance, frequency, sufficiency, affordability, and adaptability. A Transformative Investment Impact (TII) Index demonstrates its leverage utility to incentivise these practices.

Acknowledgements

I owe a debt of thanks to many who have supported my research.

First, I would like to thank my supervisors, Professor Vanesa Castán Broto and Dr Ankit Kumar, whose advice, guidance and support were invaluable throughout my PhD journey.

I am immensely grateful to the Commonwealth Scholarship Commission (CSC) for its financial support, capacity development, and linkage to other relevant CSC networks.

To the research participants, I am thankful for your generosity of time, knowledge and networks. Your contributions and resources informed this thesis. Indeed, your contribution was invaluable.

I want to thank the Department of Geography for supporting my PhD journey. The Department of Geography at Sheffield has been my academic home since my master's degree, and as of then, I am grateful for your support.

I am grateful to my parents, Musivo Nthenge and Cheptoo Musivo, for their constant encouragement and belief in me.

Finally, I want to convey my most heartfelt gratitude to my husband, David Ochieng, and my daughter, Amelia Opi, for their love, sacrifice and unending support. None of this would have been possible without you.

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Abbreviations

CapEx	Capital Expenditure
CIF	Climate Investment Funds
DFIs	Development Financial Institutions
ERB	Electricity Regulatory Board
ERC	Energy Regulatory Commission
ETA	Energy Transition and Access
FIs	Financial Intermediaries
FMO	The Dutch Entrepreneurial Development Bank
FX risk	Foreign Exchange Risk
GDC	Geothermal Development Company
GOGLA	Global Off-Grid Lighting Association
GoK	Government of Kenya
HHs	Households
IHP	Indoor Household Pollution
IPO	Initial Public Offering
IPP	Independent Power Producer
IRENA	The International Renewable Energy Agency
JICA	Japanese International Cooperation Agency
KES	The Kenyan Shilling
KfW	Kreditanstalt für Wiederaufbau
KNES	Kenya National Electrification Strategy
KPLC	Kenya Power Lighting Company
M	Million
MDBs	Multilateral Development Banks
MIGA	Multilateral Investment Guarantee Agency
MOEP	Ministry of Energy and Petroleum
NDCs	Nationally Determined Contributions

NGOs	Non-Governmental Organizations
NSE	Nairobi Stock Exchange
PA	Paris Agreement
PAY-GO	Pay-as-you-go
PDBs	Public Development Banks
PPA	Power Purchase Agreement
REA	Rural Electrification Authority
RQ	Research Question
SDGs	Sustainable Development Goals
SE4ALL	Sustainable Energy for All
SHS	Solar Home Systems
SOFIs	State-Owned Financial Institutions
SPV	Special Purpose Vehicle
SSA	Sub-Saharan Africa
TA	Technical Assistance
US\$	The United States of America Dollar

Declaration

I, Winnie Musivo, confirm that this thesis is my own work. I am aware of the University's Guidance on the Use of Unfair Means (www.sheffield.ac.uk/ssid/unfair-means). This work has not been previously been presented for an award at this, or any other, university.

Chapter 1: Introduction

Collectively, countries in the Global South - the emerging markets - and those in the Global North - the financialised economies - support Sustainable Development Goals (SDGs). Markets are a presumed channel for achieving SDGs through international partnerships (Kumar et al., 2024). SDG 7, which focuses on energy access, highlights a need to promote international investments to (implicitly) increase capital flows to emerging markets from the financialised economies. Intricately woven into the themes of SDGs are climate goals. On the broader climate goals, financialised economies agreed under the Paris Agreement (PA) to mobilise capital for emerging markets. Therefore, a global consensus exists on providing more capital to emerging markets to finance development or climate-relevant sectors. However, this is not a simplistic endeavour, as access to this capital exists within the broader financialisation context.

Financialisation is the growing prominence of financial markets, institutions, and actors in the functioning of economies nationally and internationally (Epstein, 2005). The increasing dominance of markets is also juxtaposed with the shrinking role of state actors in facilitating development or delivering their services (Kumar et al., 2024). In emerging markets, national governments state that national resources to finance development are limited (Perry, 2021). Moreover, emerging markets are subordinate and dependent on financialised economies because of global capitalism's 'uneven development' outcomes (Lapavistas and Soydan, 2022; Bernards, 2024). Ciptet et al. (2022) and Lai (2025) debate whether financing climate-relevant sectors within these financialisation conditions advances climate and development goals or increases dependency. Accumulation exacerbating the fragility and vulnerability of emerging markets as sites for capital extraction is another key concern (Bracking, 2016; Dymski, 2018). The actors' practices to enable capital flows through policy and regulations are influenced and shaped by the complex (hierarchical) relationships between financialisation actors and emerging markets. It is in this context that Kenya pursues its energy access goals by seeking pathways to finance its energy sector.

The Government of Kenya (GoK) regards the energy sector as an economic growth and development enabler. The sector has long benefitted from strong political support in the country and a national (and international) consensus that it is one of the enabling sectors that support adjacent development goals (UNDP, 2019; MOEP, 2020; The National Treasury, 2016). The sector's precedence is evident in the country's pursuit of finance for its climate change actions, as reflected in the country's many published strategy and climate finance documents, such as the Second National Communication to the United Nations Framework Convention on Climate Change (UNFCCC), National Adaptation Plan (2015–2030), Nationally Determined Contributions (NDCs; 2015), the Green Economy Strategy Implementation plan (GESIP; 2016), the National Climate Finance Policy (2018), the Mitigation Technical Analysis Report (2018–2022), the National Climate Change Policy (NCCP; 2016) and the Kenya National Electrification Strategy (KNES). Despite the government's conviction regarding the core role of the energy sector, one issue threatened this ambitious goal: finance.

As with many emerging markets, Kenya struggles to finance its development and climate change ambitions, especially in a way that aligns with SDGs. The country has emphasised its reliance on international financing in multiple national strategy documents, including the 2015 NDCs, the 2018 NCCAP 2018–2022, and the 2020 Updated Nationally Determined Contributions (2020). These documents imply a heavy reliance on international support and explicitly state that the country's achievement of its goals is contingent on this support. The Conference of Parties (COP) collectively address these issues at the international level annually. In 2015, the parties agreed, through the Paris Agreement (PA), to mobilise US\$100 billion annually to support developing countries, creating expectations for support in countries like Kenya. Some of this capital flows to Kenya to finance the energy sector through foreign direct investments and bilateral and multilateral funding, among other sources. Most of these are international public sources of finance, although there are also calls to recognise the importance of private-sector investments.

The private sector has been a key contributor to energy access in Kenya, from energy generation to decentralised off-grid energy solutions. The 2018 KNES developed a roadmap

to universal access for the country by 2022, including the estimated millions of people to be served by the private sector (mini-grids and solar lighting products). Kenya did not achieve universal access in 2022, although energy access has grown significantly. Over the years, the global and national focus on capital access for the energy sector has broadly targeted raising and accessing more capital. This target is imperative, yet capital access challenges are more complex than this. Hence, this research focuses on the energy sector's historical public and private financing, factors that control or influence access to capital, and the need to address the underlying challenges, needs and gaps.

1.1 Research Rationale

Capital access is a challenge in emerging markets, regardless of the sector. Kenya, like many other countries, is no exception in this regard. Globally, it is estimated that the annual capital needs for the energy sector range between US\$2.2 and US\$2.8 trillion (Falduto, Noels and Jachnik, 2024). In Kenya, for full transition, the Ministry of Energy and Petroleum (MOEP) estimates that the sector needs US\$600 billion between 2025 and 2060 (MOEP, 2023). The focus here is the quantum of capital necessary to finance the sector, and it has been for a long time. However, this focus identifies only one capital access challenge, and the problem is more complex than those identified by the circumscribed cost estimations. In addition, these estimates are subject to modifications depending on scope, data availability, methodological approaches, underlying assumptions and hypotheses, and cost estimation. Hence, although necessary, these capital needs estimations must be supplemented with other methods to reveal the depth and complexity of capital access challenges in the energy sector. This point is evident in Kenya's frequent revision of capital needs estimations in the first NDC, subsequent NCCAP and updated NDC in 2020 (The National Treasury, Climate Policy Initiative and The Kenya Climate Innovation Centre, 2021). Hence, these approaches are insufficient at best, and, at worst, they mask broader capital access needs that must urgently be addressed.

This thesis aims to contribute to knowledge by studying these complex capital access challenges in emerging markets within the “financialisation-centric vision of development” context (Bougrea, 2024). It studies them through the three concepts of financial ecologies:

actors, practices and relations (Green, 2024; Leyshon et al., 2004; Burton, 2020). As a result, it contributes to the following discussions: capital provision as an accumulation in the emerging markets and its exacerbated subordinate (and dependent) position; significant unevenness of investment outcomes and the factors that control (or influence) actors' practices and; sustainability of capital access for emerging markets. Finally, it proposes and demonstrates applying calculative practices as a tool to incentivise actors to broaden their outlook on capital access and provide capital sustainably. This is also a response to scholarly calls to expand the conceptual and empirical understanding of how climate and development pursuits further entrench financialisation. Robin (2022) recommends that scholars study a broader range of actors, financial instruments, and relations to contribute to this knowledge. This thesis contributes through a rich empirical analysis of investment outcomes, actors, practices, and relations in emerging markets. The next section summarises the research aims and questions.

1.2 Research Aims and Questions

This study explores capital access to energy companies (private and public) from both international public and private capital sources. The research aims to understand the country's complex and evolving capital access journey and its needs and gaps through historical investment trends and accounts. The study hopes to understand the factors influencing and controlling capital access to an energy company. Based on quantitative and qualitative analysis, the study provides a broad, comprehensive outlook of capital access that encompasses the sector's overt and covert capital access challenges.

These aims are achieved by answering the following three research questions:

1. Historical Trends: Who are the influential actors enabling capital access in Kenya's energy sector, and how do they invest?
2. Facilitating Investment Access: What factors control investment decision-making for energy investments in Kenya?

3. Investing Sustainably: What kinds of investments promote sustainability in capital access?

1.3 Methodology

A mixed-methods approach is used to answer the three research questions. Finance (or capital), by nature, is quantitative due to its monetary form. Although it is unnecessary to study finance through a quantitative lens, understanding access requires both quantitative and qualitative aspects. Therefore, this research relied on two quantitative datasets from the International Renewable Energy Agency (IRENA) and Global Lightning Off-Grid Association (GOGLA) to understand the providers, the amount and nature of capital, the investment period, and the recipients of such capital. With more than a decade of archives of public and private investments, the quantitative analysis of investment patterns and trends proved insightful in contextualising the capital flows to Kenya's energy sector, revealing broad and general sectoral capital gaps and needs.

To avoid deductive inferences and mainly to answer the second and third research questions – to understand the factors that control investment decisions and how to promote sustainability in capital access – qualitative datasets were required. An inductive, bottom-up qualitative approach used stakeholder semi-structured interviews (investors, energy companies, consultants and researchers) to investigate these questions. The study also analysed private documents provided by interviewees and publicly available documents such as government policies, strategy documents, blogs and news publications. Analytical memos summarised each interview during the data collection process to capture the key arguments and findings and reflect on the entire research.

The mixed-methods approach was effective for two key reasons: first, to link the broader global and national discussions of capital access – the (public and private) international capital flows to the country with actors' experiences and perspectives on capital access at company levels, connecting the macro with the micro; and second, to validate and enhance the reliability of the findings through triangulation. As indicated in Section 1.1, the mutability of the quantitative cost estimations depending on the applied techniques is a

limitation. The stakeholder perspectives fill this knowledge gap through their lived experiences of raising (or providing) capital and their professional understanding of the sector's capital access. Without the quantitative datasets, it is akin to solving a problem without context and or knowledge of its extent, and without the qualitative dataset, the depth and complexity of the capital access challenges would be missed.

1.4 Findings and Contributions

Energy sectors in the emerging markets are shaped and influenced by a few international public investors with individual financial dominance and collective influential force to stipulate structural and regulatory reforms. The emerging markets' reliance on international finance places them in a subordinate position, with the only option often being to acquiesce to these demands. This situation indicates the conditionality of capital access and the growing power of financial institutions. Current access to capital flows to emerging markets for development has been characterised as obtained through the “*financialisation-development nexus*”(Mawdsley, 2018), “*capitalist development*” (Bernards, 2024) or the “*financialisation-centric vision of development*”(Bougrea, 2024). All these positions indicate a shift from aid to investments, the introduction of profitability to development, and the introduction of new financial actors, mainly the private sector, derisked by public investors.

Public investors' derisking implies concessionality in financing. Although concessional debt financing was slightly higher in Kenya than commercial rate debt, the latter's absorption and growth was nearly twice that of concessional debt. This situation is worrying and positions the emerging markets (intentionally or unintentionally) as the accumulation mining ground for net capital extraction. It also reveals that not only will the sector be financed by expensive capital, coupled with foreign exchange (FX) risk and currency devaluations, but also the risk averseness of local financial institutions and a highly indebted national government mean a limited capacity to support national utility companies, demonstrating deepened and accelerating financialisation and the inevitable growth of the private sector role in the emerging markets.

The nature of development financing, most of which trickles down to the energy sector, has uneven sectoral and geographical distribution (Bernards, 2024; Falduto, Noels and Jachnik, 2024; The National Treasury and Planning, 2021; Climate Policy Initiative, 2024; The National Treasury, Climate Policy Initiative and The Kenya Climate Innovation Centre, 2021). Hence, this research argues that capital access cannot be viewed through the quantum lens due to these challenges and vulnerabilities. The global discussion of financing development, climate change and related sectors must consider the key vulnerabilities of capital access and broaden its outlook, given the context in which the capital is provided. To demonstrate this point further, uneven investment outcomes are observed in private investments.

In private investments, a few large international companies access most of the capital, whereas many local small - and medium-sized companies struggle to access capital. Investors have clustered around a few companies and shied away from the many. As a result of the clustering, concealed capital access benefits accrued to the few: 1) they were able to leverage existing relationships to access subsequent capital; 2) a rich pool of investors also acted as referral links – the most effective capital-raising mode of access – to potential new investors; and 3) they had access to the majority of the catalytic financing (equity and grants), which offered further growth opportunities. This compounded advantage further established the dominance of the few and the subordination of the many and may result in what Baker describes as the consolidation of foreign-owned or backed private sector monopolies (2023). The implication of these persisting investment trends and practices further foregrounds the vulnerability of the capital accessed within the ‘financialisation-development nexus’ due to its ability to reproduce uneven investment outcomes at best; at worst, it invests in a manner that propels the net extraction of capital from emerging markets. Notably, local financial institutions are risk-averse to investing in the sector, and risk-mitigating instruments, such as guarantees, are scarce. This gap enables the dominance of international finance in the sector. International finance funds international energy companies, and their returns accrue to international investors. However, in the long run, this is a zero-sum strategy, as the country does not have the long-term retention of capital returns; the rarity and the declining trend of catalytic finance further limit the expansion of the investment universe in the sector, and niche populations fall behind in the bid to achieve

universal energy access. The energy market in Kenya has weak domestic public and private backing for the sector; the former is highly indebted, and the latter is too cautious, hence the reliance on (public and private) international finance. Therefore, it is imperative to understand stakeholder perspectives on the factors that control investment decisions that result in uneven investment outcomes.

Exogenous factors (globally and nationally) and endogenous factors (at the company level) influencing capital access skew investments towards large companies due to high profitability expectations in the emerging markets. At the global level, financial intermediaries (FIs) – investors fundraising to bring capital to Africa – state that international public and private investors are increasingly risk-averse to providing capital to Africa, affecting the amount of capital trickling down to energy companies. In addition to this, the perceived high risk is priced in the cost of capital, making it more expensive. However, despite risk aversion, partnerships among the investors resulted in more capital flows due to risk-sharing at a company level (Turkelli, 2022). Nationally, investors view regulatory instability as an additional risk, which dissuades them from providing capital, and when they do, they price this risk. This expensive, limited capital flowing into emerging markets in the energy sector is highly competitive and prohibitive. It is unsurprising, then, that the intrinsic factors evaluated at a company level, which influence selection, prioritise profitability. Hence, investors are ineluctably skewed towards large companies due to the pursuit of high returns, a natural consequence of introducing '*profitability*' into financing development (Bougrea, 2024). In addition, small companies often have severe skill gaps they cannot afford to fill, affecting their ability to report sufficiently on sustainability impact metrics, reducing their chance of investment selection. In general, capital access for the energy sector within the '*financialisation-centric vision of development*' context inescapably produces uneven investment outcomes skewed towards large international companies, while small local ones continue to struggle.

There is a harsh reality that the emerging markets must contend with: on the one hand, their ambition for development pursuits, but on the other, their inability to afford or significantly incentivise local private investors domestically. Since it cannot abandon its pursuits, the

solution lies somewhere between incentivising local investors and finding ways that encourage better and more sustainable ways of drawing international capital. The approach should not be all or nothing. Hence, this research proposes the use of calculative practices to create indices that encompass identified capital needs (from empirical findings) to achieve two goals: 1) to capture contextually relevant capital needs, and 2) to optimise the existing investment practice that leverages sustainability metrics for capital access. First, this study establishes that capital access is more than just the amount of capital provided, and a focus on this aspect conceals other capital access gaps and needs. For Kenya's energy sector, it redefines capital access to '*capital access sustainability*' (CAS), defined as '*frequent and affordable capital flows that are adaptive, relevant and sufficient to the needs of the sector/industry, providing a broader reach of financial provision to companies or projects of different sizes or at different stages*'. This approach is taken to dissuade a sole focus on capital quantum. Second, an illustrative Transformative Investment Impact (TII) index was created to evaluate investments in Kenya. The results highlight that although some investors did not provide the highest amount of capital, they catered to other capital needs and gaps within the CAS framework. Hence, this research posits a shift from a quantum focus only to a broader capital access view and its leverage to motivate capital responsiveness to Kenya's energy sector needs.

This research makes a rigorous empirical contribution to understanding capital access in emerging markets, particularly Kenya's energy sector. The study examines this subject through the lens of the 'financialisation' context within which this capital is provided. Capital access needs and gaps are complex, and to cater effectively to them, they should be reframed to reflect this complexity. CAS not only focuses on the amount of money that flows into a country or company, it also combines the following: how probable it is to receive capital, when you receive it, in what form, its responsiveness and adaptiveness to capital needs, and its cost. Moreover, it combines financialisation and calculative practices to demonstrate the integration of identified capital needs to indices and their utilisation in evaluating and leveraging to encourage investments that reduce uneven investment outcomes.

1.5 Key Terms: Definition and Use

The issue of capital access is core to this thesis. The words '*capital*', '*investments*' and '*finance*' are used interchangeably to mean the amount of funds investors or FIs provide to energy companies via different financial instruments.

1.6 Thesis Outline

Following this introduction, **Chapter 2** provides the context of Kenya's energy transition and access, as well as the theoretical context within which its financing operates. The chapter outlines the theoretical context of financialisation and discusses the concepts of financial ecologies and calculative practices to examine the sector.

Chapter 3 explains the choice and rationale for selecting a mixed-methods approach. It highlights the need for extensive quantitative datasets and in-depth qualitative datasets to study capital access in Kenya. Also, it details the researcher's analysis and positionality.

Chapter 4 explores Kenya's energy sector's (primarily international) public investment journey from 2000 to 2020, informed by the IRENA dataset. The chapter analyses public investors' overall investment trends and patterns, the nature and form of the investments and the technologies funded. The analysis considers the influence of public investors, their role in the regulatory reforms in Kenya, and the consequential access to capital. The findings regarding the investment trends and patterns indicate that Kenya's energy sector can be divided into '*capital paucity*' and '*capital growth*' stages. The chapter further focuses on the highest 'publicly' funded technology – geothermal – to highlight three key capital access issues: the inevitable diminishing role of domestic public financing by the government and its effect on capital access of national utilities; persisting capital access issues, such as FX risk, and bureaucracies; and the increasingly complementary role of the private sector, such as the Independent Power Producers (IPPs).

Chapter 5 explores Kenya's energy sector (primarily international) private investment journey from 2012 to 2022, informed by the GOGLA dataset. The chapter conducts a comparative regional capital access analysis with Kenya's two neighbouring countries: Uganda and Tanzania. At the national level, the analysis focuses on the actors (investors and

the energy companies) to study how the capital was invested, the amount, the financial instruments and the size of the companies. To complement this analysis, interview data is used to study the role and utility of different financial instruments, providing depth to understand the benefits (or lack thereof) of accessing such financial instruments. Finally, having identified the dominance of a few large international companies and the struggle of small local energy companies, the chapter examines how different capital access pathways affect access to capital, exposing the concealed advantage of relationships and clustering for the large companies, as well as the extent and depth of the struggle for the small companies.

Chapter 6 discusses key endogenous and exogenous factors that control or influence an investor's decision in selecting an investee or capital recipient. The chapter considers broad global and national factors (exogenous) and company-level (endogenous) factors that favour or disfavour the capital flowing to the country and, ultimately, the companies. The following four endogenous factors were identified: financial performance, company management, business model and company size/stage. Exogenous factors included the regulatory framework's stability, general capital availability and affordability, sustainability impact metrics, and investor partnerships and collaborations. Although this analysis provides a broad picture of the key aspects that influence companies' access to capital, it is also an attempt to understand the uneven investment outcomes in the country and the skewness and clustering of capital in a few companies.

Chapter 7 proposes a broad outlook on capital access by introducing a new definition to capture CAS, integrating the sector's most pressing capital gaps and needs. It applies calculative practices to create a TII index for evaluating an investor's capital provision using the newly defined CAS for two reasons: 1) capital access is more than just the amount of money provided, and 2) to utilise the existing investment practices of leveraging sustainability metrics to access more and cheaper capital for the sector.

Chapter 8 presents the conclusions of this thesis.

Chapter 2: Understanding Capital Access for the Energy Sector Through the Financialisation Context

This chapter contextualises Kenya's energy sector, capturing its focus on transition and energy access and, most importantly, its financing. The chapter discusses the theoretical framework of financialisation as a lens through which to understand and discuss capital access for the sector. The discussion utilises the concepts of financial ecologies and calculative practices to study capital access. The concept of financial ecologies enables the research to focus on actors, practices (logic, instruments and measurements), relations (interactions and connections) and outcomes. To the concept of practices, the calculative practices of sustainability accounting are added to discuss its role and utility in broadening the outlook on capital access.

The first section focuses on three aspects of energy transition and access: the adopted understanding of energy transition and access (ETA) in this research, the context within Kenya's energy sector, and its financing. The second section reviews the literature on the theoretical framework of financialisation. The third section discusses how energy sector financing is viewed through the financialisation lens. The section after this discusses financial ecologies and calculative practices concepts to study energy sector financing. The final section summarises the chapter's discussion.

2.1 Energy Sector Context in Kenya and Its Financing

2.1.1 Energy Transition and Access

Energy transition, predicated on sustainability through the energy sector, is both a temporal and a geographical revolutionary change from one energy system to another, characterised by a shift in energy sources, technologies and energy-use patterns in a specific geographical unit (Newell and Phillips, 2016; Sokona, Mulugetta and Gujba, 2012). These changes are actualised in regulation, infrastructure, industry networks and standards,

technology, energy sources, investments, energy providers, and user practices (Geels, 2002). Historical energy transition, at both global and national scales, analysed energy system shifts from different primary energy sources and technologies in the energy mix to capture broader societal changes, such as industrialisation (Bridge et al., 2013). Such changes include the ‘liberalisation’ of the energy sector, altering the structure of ownership and competition (Bridge et al., 2013). This has led to the proliferation and prominence of non-state actors in the provision of energy services, *transitioning* what was “historically a public good...into the realm of *private resource or private commodity*” (Kumar, Höffken and Pols, 2021, p. 7). This has been and still is the case in Kenya. The 1990s energy market liberalisation, facilitated by the World Bank through financing of \$700 million, focused on legal and regulatory reforms to attract private sector participation (Newell and Phillips, 2016). The success of these reforms is now evident, as Volkert and Klagge (2022) state that the private sector, together with their partners, especially international donors, now play a significantly more important role in off-grid energy solutions. Evidently, these regulatory efforts introduced new energy transitions.

In the 21st century, the challenge is to realise a low-carbon energy transition to achieve universal energy access characterised by sustainability, efficiency, affordability, reliability and even modernity. This is primarily interpreted as a shift from fossil fuels or high-carbon resources to low-carbon resources, coupled with reduced energy consumption, mainly in the Global North. In contrast, in the Global South, the goal is to achieve universal energy access and increased energy consumption from lighting, cooking, appliance usage and productive use to bolster livelihoods, reduce poverty and improve the general quality of life (Kumar, Höffken and Pols, 2021). This further emphasises that the “energy access’ discussion needs to take place in the context of energy transitions, giving due consideration to the productive sector as an important vehicle for change” (Sokona, Mulugetta and Gujba, 2012, p. 3). Equally important is to monitor the growth of energy utilisation in energy-enabled sectors such as agriculture or industrial use to understand the extent of achieved “energy access” (Falchetta et al., 2022).

The pursuit of “energy access” in the low-carbon transition era is a modern energy service (SE4All and MOEP, 2016). The term “energy access” is not universally defined; therefore, different organisations, such as Sustainable Energy for All (SE4All), the International Energy Agency (IEA), and the Asian Development Bank (ADB), define it differently (Sokona, Mulugetta and Gujba, 2012). However, the term is generally understood as eliminating energy poverty, ensuring populations are connected to the electricity grid, or obtaining off-grid energy solutions, such as solar home systems (SHS).

2.1.2 Context: Understanding Kenya’s Energy Transition and Access

Kenya’s energy transition is based on the foundational principles of sustainable development. Therefore, the transition covers a broad spectrum of activities, from electricity-generation technologies to business and household usage of technologies for lighting, cooking and productive use. Energy access considers three key factors: supply, demand and the scale of energy services usage. Regarding supply, Kenya aligns itself with the World Bank’s multi-tier framework for electricity, which considers the following factors: capacity, duration, reliability, quality, legality, and health and safety, whereas demand is aligned with willingness to pay and affordability. Energy services usage considers household-level basic energy needs, productive uses, and broader societal functionalities, such as transportation (AGECC and UN Secretary-General’s Advisory Group on Energy and Climate Change, 2010). Kenya has adopted the SE4All definition highlighted in Kenya’s Investment Prospectus (IP).

“The (IP) has been developed for the GoK in order to attract investment in the country’s energy sector, and in particular to address the country’s SE4All goals of ensuring universal access to modern energy services, doubling the global rate of improvement in energy efficiency and doubling the share of renewable energy (RE) in the global energy mix by 2030.”

(SE4All and MOEP, 2016: ix)

By adopting SE4All's definition of energy access, Kenya aligns with the multi-tier analytical framework of energy access that moves away from the binary understanding of energy access of "having/not having electricity connection and the existence of availability of non-solid fuels for people" (SE4ALL, 2013, p. 1). However, it recognises that access is a function of the availability and proximity of such energy services to people, coupled with the people's ability and willingness to pay for a wide range of usage in HHs, for productive use and its application at the societal level (Dubey et al., 2020; Bhatia and Angelou, 2015).

Therefore, the energy transition goal is not just the shift to low-carbon energy sources but also preserving and improving quality of life while conserving the environment, all of which are driven by institutional, social, technological and political changes. Although energy access is a separate goal from energy transition, the two are carried out simultaneously in practice. The purpose of energy access is to achieve the broader goal of low-carbon energy resource usage in energy supply and provide access to energy sources that help people transition from traditional sources, such as wood, charcoal and kerosene, for cooking and lighting, breaking the reliance on traditional energy sources (Kumar, Höffken and Pols, 2021). Equally important is ensuring that low-carbon energy reaches new populations; however, this is not without challenges.

One of the key challenges of transition is the spatial lock-in (Bridge et al., 2013). Regarding energy supply, Kenya, as with other places in Sub-Saharan Africa (SSA), has limited lock-in and embeddedness of high-carbon resources because most energy resources come from renewable sources. Although Kenya has relied on some high-carbon energy sources, most large energy infrastructures were hydropower dams funded and built between the 1960s and 1990s, constituting about two-thirds of the country's energy generation in the 1990s (World Bank Group, 2020; The World Bank, 2019). Similarly, regarding energy access, because many parts of the country were not connected to centralised electricity before 2012, this created an opportunity to embrace off-grid energy solutions (KNBS, 2009). Park (2021) observes that the off-grid energy solutions have significantly altered energy transition in Kenya. Therefore, a limited spatial lock-in for lighting energy sources was an advantage for the energy transition goal, which may differ for the cooking sub-sector. The Ministry of

Energy, in its national electrification strategy (KNES), highlighted that high connection costs, high electricity supply costs to rural and peri-urban areas, and a lack of incentives to attract private investors are the main reasons for limited electricity connections (MOEP, 2018).

In Kenya, the government and the MOEP regard energy access as an enabler of development and a catalyst for achieving the country's 2030 development goals and the four priority economic pillars (UNDP, 2019; MOEP, 2020). These four pillars are food security, manufacturing, universal health coverage and affordable housing. The 'energy for development' literature is not new and has been widely discussed by both practitioners and academics. On a broader scale, energy access is expected to lead to socioeconomic development and the improvement of human development indicators, such as poverty reduction, improved livelihoods, improved health outcomes and better education (Castán Broto and Kirshner, 2020; Kumar, Höffken and Pols, 2021; Leach, 1992; Sokona, Mulugetta and Gujba, 2012). In the mid-2000s, Kenya launched this strategy through the work of the Rural Electrification Authority (REA) in its rural electrification programme, which connected electricity to educational (primary and secondary schools) facilities, health facilities, such as dispensaries in rural areas, trading centres and water projects (MOEP, 2018).

In 2016, the MOEP published an IP detailing the investment opportunities in Kenya across the energy sector and highlighted a list of 25 priority projects that needed financing (MOEP, 2016). In 2018, Kenya pursued on-grid and off-grid energy solutions to achieve universal energy access, as highlighted in the KNES (MOEP, 2018). The KNES estimated that universal access would be achieved by connecting 5,651,300 households (HHs): three million HHs through grid expansion, intensification¹ and densification;² 35,000 HHs through 121 minigrids; and 1,960,000 HHs through SHS. The MOEP estimated it would

¹ Grid intensification is the addition of distribution transformers and short (up to two kilometres) medium-voltage extensions to capture more consumers (MOEP, 2018).

² Grid densification is the connection of all consumers within 600 meters of existing distribution transformers where there is no need to add additional distribution transformers (MOEP, 2018).

achieve universal energy access by 2022 and, thereafter, only cater to the growing new population.

In the same plan, the MOEP estimated that Kenya needed approximately US\$2.75 billion of public and private finance to achieve universal access between 2018 and 2022, as well as approximately US\$292.2 million to cater to the growing population between 2023 and 2027. The KNES estimated that US\$2.3 billion would be needed for electricity connections' distribution infrastructure.

Figure 1, below, illustrates the KNES investment needs (2018–2022).

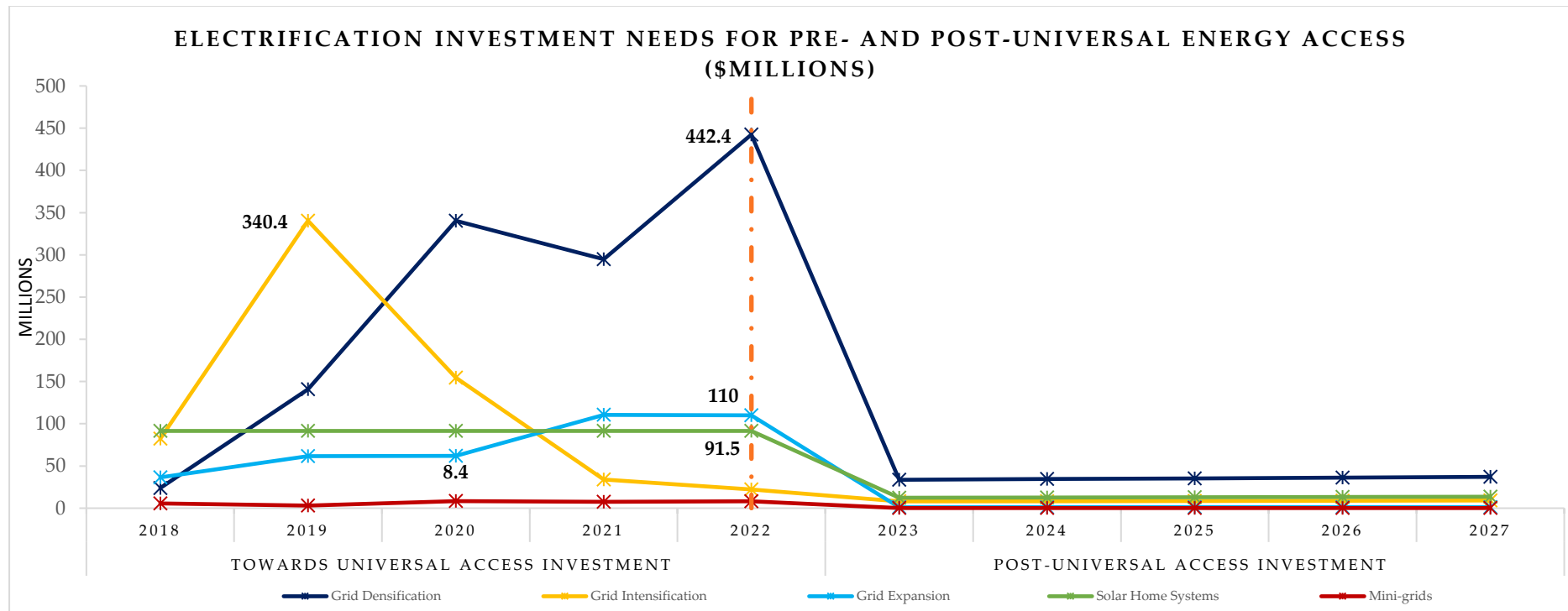


Figure 1: KNES Investment Needs to Achieve and Maintain Universal Energy Access

Figure 1 estimated investment needs by intervention, as outlined in the KNES 2018, which aimed to achieve universal electricity/lighting connections by 2022 through grid and off-grid solutions.

The electrification plan, though accommodating for private sector participation, prioritised on-grid electricity connections, with the bulk of the investment planned for grid densification (42.87%), intensification (20.42%) and expansion (19.90%) by the KPLC, the national energy distribution utility. Meanwhile, the SHS and mini-grids were earmarked at 15.79% and 1.03% of the planned connections, respectively. This strategy reveals the curved-out market for each intervention, (indirectly) highlighting the government's preferential pathway to achieving universal energy access based on the earmarked role and extent of allocated households' reach on different interventions.

Although Kenya failed to achieve universal energy access by 2022, its emphasis on grid electricity connection paid off. As of June 2023, the national distribution utility company, KPLC, had over 9.2 million customers, a 232% increase between 2013 and 2023 (KPLC, 2023). Approximately 7.5 million (81.15%) of the 9.2 million customers were domestic HHs (KPLC, 2023). Therefore, ~57.8%³ of Kenyan HHs are connected to the grid (KPLC, 2023; Kenya National Bureau of Statistics, 2023). Furthermore, the KPLC has a low emissions factor. In 2023, more than 81.31% of the KPLC's distributed electricity was from renewable energy sources: geothermal 45%, hydro 19% and wind 17% (KPLC, 2023, p. 161). Table 1 below summarises KPLC's power purchases by technology in the year 2022/2023, showcasing higher purchases from renewable energy sources.

Table 1: KPLC Power Purchases by Technology in 2022/2023

Technology	KPLC power purchases (%)
Geothermal	45.41%
Hydro	19.33%
Wind	16.57%

³ This is calculated using the following datasets: The KPLC 2023 reported 7.5 million domestic customers. This amount is divided as a percentage of the number of HHs in Kenya as of 2022. The KNBS 2023 economic survey estimates Kenya's population to be 50.6 million by 2022. This amount is divided by the national average HH size (3.9) as reported in the KNBS 2019 census report. Hence, the total number of HHs is estimated at 12,974,359 as of December 2022. Therefore, the estimate is 7.5/(12.97). This estimate results in ~57.8% of the total HHs in Kenya having an on-grid connection as of December 2022.

Thermal	10.50%
Net Imports ⁴	4.85%
Others	3.34%
Total	100%

Despite progress on grid electricity connections, less than 1% of these HHs use electricity as a primary cooking fuel. Similarly, the MOEP in 2019 conducted a clean cooking sector study reporting low use of electricity as a cooking energy source. The MOEP's findings on different cooking energy sources are summarised in Table 2 below.

Table 2: HHs Cooking Energy Use (as reported by MOEP in 2019)

Cooking Energy Source	HHs Percentage Use
Woodstoves	70%
Charcoal stoves	42%
LPG stoves	30%
Kerosene stoves	11%
Electrical appliances	3%

Although cleaning/cooking was not a priority segment of the energy transition, it has grown over the past few years. Strikingly, Table 2 also shows high HH usage of traditional cooking energy sources, especially woodstoves and charcoal (CCAK and MOEP, 2019). Later in 2024, the MOEP reported that nearly 50% of HHs in Kenya stack fuels and stoves, often using different cooking fuels and stoves depending on availability, reliability and affordability (MOEP, 2024). The detrimental health effects of indoor household pollution (IHP) caused by using traditional fuels have been emphasised (Castán Broto and Kirshner, 2020; Kumar, Höffken and Pols, 2021; Weijnen, Lukszo and Farahani, 2021). Approximately 3.2 million people die annually from IHP globally, with 638,583 in Africa and 22,283 in Kenya (WHO, 2023). Therefore, Kenya has pursued and continues to pursue many aspects of transition and access, and to achieve it, it needs financing.

2.1.3 Financing Energy Transition and Access

⁴ Net imports and 'others' contain both renewable and non-renewable energy sources that are not specified in the KPLC 2023 annual report

“It is generally accepted that the financial sector has an instrumental role to play in capital allocation and the financing of projects and companies.”

(Michoud and Hafner, 2021, p. 112)

Energy sector financing comes under the umbrella of sustainable (or international) development and climate finance, constituting mitigation and adaptation finance. International public and private finance are vital, as these are global collective endeavours, as evident in the PA, the SDG 7 and even multilateral development bank reports to scale development financing from billions to trillions (The World Bank Group et al., 2015). As a result, countries outline their capital and financial needs in different climate, development or sectoral strategy documents. One of these documents is the NDC⁵.

Every five years, countries submit NDCs – documented non-binding country-specific climate action ambitions – to the United Nations Framework Convention on Climate Change (UNFCCC). Article 4 of the PA, paragraphs 2 and 3, mandates each country to estimate methodically their climate targets relative to their capabilities, resources and circumstances under the principle of “common but differentiated responsibilities” to document individual contributions to the international collective action (United Nations, 2015).

In 2020, Kenya updated its 2015 NDC to the UNFCCC, estimating it needed approximately US\$62 billion for mitigation and adaptation activities. This update included a pledge to provide 13% of this financing through domestic public funds, a leap from its 2015 NDC, which stated the country’s NDC targets were entirely reliant on international finance. Furthermore, the government hoped that 70% of financing would come from international public and private sources. The NDCs have stated that the low-carbon development commitments are strictly conditional on international support through finance, investments, technology transfer and capacity-building (Ministry of Environment and Natural Resources,

2015; Ministry of Environment and Forestry, 2020; The National Treasury, Climate Policy Initiative and The Kenya Climate Innovation Centre, 2021).

In 2018, the National Treasury and its partners tracked Kenya's capital flows to different sectors, providing the first account of capital flow monitoring for climate and development financing. The results indicate that Kenya continues to struggle to raise sufficient climate financing, with only one-third of the needed funding in 2018. In contrast, the findings reveal that the energy sector is the most funded of all the climate-targeted sectors, with most investments flowing to that sector, especially mitigation financing. The study also distinguishes between public international and domestic spending, as well as private international and domestic investments and the country's self-financing ability. The results are encouraging, indicating high participation of the public⁶ (28.3%) and private (14.0%) domestic investments. Public international financing provided 31.1%, and the private sector provided 26.7% overall, providing more financing (The National Treasury, Climate Policy Initiative and The Kenya Climate Innovation Centre, 2021; United Nations, 2015). This also indicates higher domestic public spending on climate financing than was committed to in Kenya's NDCs, which were set at 0% in 2015 and 13% in 2020.

Domestic public financing is essential because it is the financing lever often used to leverage private investments. In some cases, Development Financial Institutions (DFIs) and Multilateral Development Banks (MDBs) prefer to channel financing through the government instead of directly financing state-owned utility companies for subsequent government financing, such as on-lending (Saitet and Muchemi, 2015). Although these capital flows may be significantly affected in the future because Kenya is among 10 countries categorised as at a "high risk of being debt-distressed" by the International Monetary Fund (IMF), and also among the 17 countries to have a credit downgrade since 2020, the landscape in 2018 was different (CPI, 2024). In 2018, 50.11% of bilateral development partners' funds and 63.55% of MDB partners' funds were channelled through the government (The National Treasury, Climate Policy Initiative and The Kenya Climate Innovation Centre, 2021). Cumulatively, more (55.82%) public international financing was channelled through the

⁶ Ministries and state departments

GoK's central budget than through direct investments: KES 75.9 billion was channelled through the national budget in 2018 (KES 42.2 billion from international public sources and KES 33.7 billion from domestic sources). Moreover, 50% of the KES 75.9 billion was channelled to mitigation sectors, 30% to adaptation and 20% to cross-cutting sectors (The National Treasury and Planning, 2021).

The mitigation arm of climate change not only dominates financing but is also the bulk of the financing flows to the energy sector (The National Treasury and Planning, 2021; Climate Policy Initiative, 2022; Climate Policy Initiative, 2024; Falduto, Noels and Jachnik, 2024): KES 37.2 billion of the KES 38 billion of the mitigation financing channelled through the government was to sustainable energy (generation, transmission and distribution). Although the NDC initially estimated the energy sector needed approximately KES 91.6 billion that year, it received nearly twice as much, at KES 180.4 billion (The National Treasury, Climate Policy Initiative and The Kenya Climate Innovation Centre, 2021). The report also reveals that 34.4% of the private sector financing came from domestic Kenyan companies, and the rest came from international private companies. Notably, 99.7% of the international private finance was invested in RE projects, flowing to off-grid solar and large-scale grid-connected plants. Despite the uneven sectoral capital distribution, overall, developing countries are keen to have an investment appeal to attract investments, and part of this is undoubtedly through legal and regulatory frameworks.

Many countries aim to create a conducive investment environment to attract more investment. The World Bank ranks Kenya 56th globally and third in SSA for ease of doing business (World Bank Group, 2020). Eberhard et al. (2018) highlight that at a country level, an improved investment environment, sector reforms, and reliable regulatory frameworks are success factors for capital access. Newell and Phillips (2016) state that Kenya is considered a pilot country for most things and is favourably compared with its East African neighbours for being a capitalist market with a keen focus on the private sector from its independent democratic infancy.

The regulatory and legal framework reforms of the 1990s catalysed the liberalisation of the energy market by introducing private sector participation, unbundled national utilities, an independent regulator, and competitive procurement procedures, which played a key role in attracting both domestic and international financing. Although the liberalisation of the energy market may be assumed to be a natural consequence of capitalistic markets within which the country's economy operates, in reality, that is not the case. Polanyi highlights that free markets are a myth and cannot sufficiently self-regulate (Polanyi, 2001; Castree, 2008); rather, markets are brought into being, made or re-made iteratively through a political process of regulation and re-regulation (Newell and Phillips, 2016). Regarding the energy market in Kenya, the energy sector reform that led to a hybrid market (partly public, partly private) was created through a series of regulations and legal frameworks formulated by the state. The conspicuous role of international MDBs, such as the World Bank Group, included financing for the reforms but with a stringent disciplinary conditionality to withhold future funding should such reforms not be made (Newell and Phillips, 2016; Godinho and Eberhard, 2019). That said, attracting investments at country and sectoral levels from diverse sources is shaped by national and global framings of such financing. In this case, climate and development financing has increasingly favoured market actors and financial institutions, especially the private sector. The next section discusses how the theoretical framework of 'financialisation' provides the context for understanding financing for the energy sector.

2.2 Theoretical Context: Literature on Financialisation

Financialisation offers a broad lens for understanding capital access because it covers many processes, structures, practices and outcomes at different scales and time frames. The concept is a broad theoretical framework previously applied to the problematisation of financialised capitalistic and economic systems; the relational causality and effects of neoliberalism, capitalism and globalisation; and the proliferation, acceleration and dominance of financial processes, practices, outcomes, effects and limits (Mawdsley, 2018; Aalbers, 2019; van der Zwan, 2014; Dymski, 2018). Therefore, the concept was applied to study financial actors and institutions to understand their motives, logics, practices, instruments, limits, effects and outcomes in domestic and international economies at different scales (state, corporate,

household and individual levels (Cingolani and Toporowski, 2024; Mawdsley, 2018; Aalbers, 2019).

The breadth of financialisation offers the flexibility and room to discuss capital access for the energy sector in Kenya. Financialisation is critical in this research because investment flows and access to capital are always part of the broader framings of development and climate finance, which are part of Africa's new “financialisation-centric development” narratives (Mawdsley, 2018). Furthermore, SDG 7 relies heavily on international finance to achieve its transition and access goals. Taggart and Power (2024) and Perry (2021) emphasise that SDGs broadly rely heavily on the mobilisation of international finance by detailing the United Nations’ narratives. In addition to reliance on international finance, there was also a turn in Kenya towards private finance. In 2015, the MDBs reported that international public funds were severely insufficient to fund sustainable development and that, to bridge the ‘finance gap’ by scaling development finance from billions to trillions, public finance must ‘catalyse’, ‘mobilize’ and ‘de-risk’ private finance (The World Bank Group et al., 2015; Bernards, 2024). Although this report was received with great enthusiasm, some scholars have remained pessimistic, fearing a transfer of risk to the public to provide a safety net for private investors, a global shift of aid to investment that ultimately opens up private profitability in ‘development’ policy (Bougrea, 2024; Taggart and Power, 2024; Gabor, 2021). This global shift, which ultimately manifests at national scales, has transformed development finance actors' relationships from mainly donor/aid recipient relationships to investor/investee ones. Moreover, developing countries, such as Kenya, that rely on international finance are transformed from aid destinations to ‘emerging markets’ or ‘frontier markets’.

As a result, some have dissuaded, cautioned, or even outrightly advocated the return of public financing, citing that the private sector ineluctably privileges profitability, and its place in the development sector is altogether questionable (Bracking and Leffel, 2021; Karwowski, 2021; Perry, 2021). The reliance on international finance for development and the ‘private-turn’ mean scholars have coined new phrases for this type of development. Currently, the access to capital flowing to emerging markets for development has been

characterised as either obtained through a “*financialisation-development nexus*”(Mawdsley, 2018), “*capitalist development*” (Bernards, 2024) or a “*financialisation-centric vision of development*”(Bougrea, 2024). A broader understanding of its origins and application as a theoretical framework is now explored to understand this new perspective of development characterised by financialisation.

Although the term “financialisation” was first coined by Kevin Phillips in 1993 to capture the persisting division and shift from real to financial economies globally, Epstein’s definition is frequently used (Sawyer, 2013). Epstein defined financialisation as “the increasing importance of financial markets, financial motives, financial institutions, and financial elites in the operation of the economy and its governing institutions, both at the national and international levels”(Epstein, 2005, p. 3). The concept of financialisation offers a multidisciplinary outlook and literature to understand at different scales the proliferation, penetration and power of financial markets, actors, practices (logics, measurements) and narratives transforming global economies, national states, corporate firms and HHs (Aalbers, 2019).

Researchers have applied financialisation in both broad theoretical and narrow empirical studies. At the macro level, financialisation has been used to discuss capitalism and economies. Some authors have used this concept to study the epochal evolution of economic systems or the stages of capitalism as “*financialised economies*” or “*finance-led economic systems*”(French, Leyshon and Wainwright, 2011; Sawyer, 2013; Mawdsley, 2018). Sawyer (2013) highlights that although economies operate in a capitalistic system, they are dynamic, and their form evolves over space and time. Therefore, Sawyer recommends that, when using financialisation as a theoretical framework, it is essential to elucidate “the general approach (financialisation) being adopted and the period and space to which the analysis applies”(Sawyer, 2013, p. 16). The broad theoretical application of the concept in studying the epochal evolution of capitalistic economies has led to the conclusion that the current “stage of capitalism” has several implications.

First, it shifted the investment from real production to the rise of rentier profitability. Mawdsley highlights that financialisation is the formidable force steering capitalism's shift from “‘real’ production (primary, manufacturing and services) to finance (investment banking, insurance, arbitrage, asset management, venture capital, currency trading and so on)” (Mawdsley, 2018, p. 265). The rise of rentier profitability – profits made from financial profits and incomes – adversely affected the investment and growth of real production due to the shift of investments to financial services. Second, globally, and unsurprisingly, there was a wide discrepancy in the expectations of asset growth in the financial and real production markets (Froud et al., 2000). The former was expected to grow by double digits and the latter by single digits (French, Leyshon and Wainwright, 2011). This enticed investors to shift their resources to capital markets (Bracking, 2016; Krippner, 2005). Others used financialisation to distinguish different capital forms from interest-bearing ones (Bonizzi, 2013). Predictably, all this highlighted the subordination of real productive investment to investments in financial markets and the integration of real productive accumulation to interest-bearing capital and, hence, a financialised accumulation. In other words, people invest in highly profitable financial markets, and when they do not, they extend debt to real production to gain profitability (Bonizzi, 2013). Therefore, finance increasingly reduces its assistance in running and operating the real economy (goods and services), and instead, finance has come to dominate or even displace it.

Due to its breadth of application, financialisation has been criticised as imprecise, vague and ambiguous. French et al. (2011) identified three intellectual schools regarding financialisation: regulation theory, critical social accountancy, and a sociocultural approach (financialisation of everyday life). Similarly, Aalbers highlights three conceptualisations of financialisation: a “regime of accumulation, financialisation as the rise of shareholder value, and the financialisation of daily life” (Aalbers, 2019, p. 2). These two studies provide the lens through which financialisation has been studied. Many of which overlap. The following section reviews the literature relevant to this research and discusses its applicability to this study.

2.2.1 Financialisation as a Regime of Accumulation

Financialisation has been described as exacerbating the vulnerability of economies, particularly developing ones. Van der Zwan claims that the imbalances that arise from states with surpluses and those with deficits as a result of the liberalisation of capital flows have led to boom-and-bust cycles and exchange rate volatility (Epstein, 2005; van der Zwan, 2014). Hence, it has been argued that a core distinguishing characteristic of capitalistic economies is their “chronic financial fragility”, with financial crises forming a normal cyclical rhythm during boom-and-bust cycles (Bracking, 2016; Lapavitsas and Soydan, 2022). Furthermore, capitalistic economic crises, though accompanied by financial crises, are not a result of financial crises (Dymski, 2018). Given such intrinsic vulnerabilities and instabilities of capitalistic economies, Dymski (2018) concludes that financialisation deepens these issues. However, this criticism has not deterred or slowed financialisation in aiding accumulation. Bonizzi et al. (2022) assert there is a clear contrast between spatially limited cyclical and speculative financial crises relative to the overall increase in the dominance of financialisation that has shaped or created ‘mature capitalism’, for which the expanding and transforming utilisation of finance is essential to the process of accumulation.

Scholars have also explored the relationship between financialisation and broader concepts, such as neoliberalism, globalisation, privatisation and capitalism, although this research is highly contested. Although the distinctions and relationships between these concepts are outside the scope of this research, a brief highlight reveals the overall understanding of scholars. Despite the concept being fiercely debated, Van der Zwan (2014) claims financialisation is not only a logic of capitalism but also arguably a primary driving force or cause of neoliberalisation. Others have labelled the current period “*neoliberal financialisation*” (Sawyer, 2013). Klagge and Nweke-Eze state that “liberalisation and privatisation are precursors of financialisation” (2020, p. 64). French, Leyshon and Wainwright (2011) claim it is clear to them that neoliberalism and financialisation are co-constitutive and, although difficult to determine emergence and causality, in operating collectively, their complementary force has led to the ‘hegemonic model of market economy’. Financialisation has been used as an adjective for economies and capitalism, such as “financialised economies” or “financialised capitalism”, to describe a characteristic of the broader existing economic and capitalistic systems. This either denotes the current stage of

capitalism or the distinguishable characteristic of current neoliberalism. Mawdsley stresses that “most analysts frame financialisation, in various ways, as a ‘later stage’ of late capitalism, produced and enabled through neoliberal restructuring” (2018, p. 266).

Sawyer highlights Epstein’s work by stating that the market’s role has increased, whereas that of government has reduced, and that economic and financial transactions among countries have increased greatly; hence, the capitalistic landscape has changed, characterised by globalisation, neoliberalism and financialisation (Epstein, 2005; Sawyer, 2013). Although it is difficult to determine the causal relationship between financialisation and neoliberalism, they have interests that coincide and are, at times, co-constitutive of each other (Bonizzi, 2013; Mazzoli, 2005).

Scholars of financialisation as an accumulation regime have cast their analytical nets wide to understand the relationship or connections between financialisation, neoliberalisation and globalisation. This body of work has extensively highlighted the intrinsic weakness of capitalistic economic systems and their vulnerability to boom-and-bust cycles. The literature further highlights the significant shift of investments from real production to financial activities, marking this a major characteristic of financialisation. Consequently, this led to the financialisation of non-financial firms, the growth of the rentier class and the securitisation of previously non-financial objects to securities subject to speculative trading. Marxist accounts of financialisation further distinguish between interest-bearing capital and other forms of capital, postulating that the integration of real accumulation into the realm of interest-bearing capital leads to systemic financialised accumulation (Bonizzi, 2013). Others have argued that a precondition to financialisation is the availability of local and foreign investors willing and able to buy ownership of companies. Scholars have observed this phenomenon even in countries termed ‘less financialised economies’ (French, Leyshon and Wainwright, 2011; van der Zwan, 2014). This phenomenon has led to the evolution of financial services with greater reliance on capital markets, the rise of non-bank lenders and the shift of bank investments in more financial instruments and activities rather than in real production (Aalbers, 2019; Hudson, 2008).

This body of scholarly work has maintained a global focus on the financialisation trends and their effect on capitalistic economies. The increase of international capital flows from countries with surpluses to those with deficits means subordination has become a major aspect of the financialisation discussion.

2.2.2 Subordinate Financialisation

The literature on financialisation has also explored the relational power dynamics between advanced capitalistic economies and emerging economies. The concept of subordinate financialisation establishes that there are core countries (advanced capitalistic economies) and periphery countries (emerging markets). Arguably, the antecedents of subordinate financialisation were studies of uneven development theories and dependency. Lapavitsas and Soydan (2022) postulate that financialisation in developing countries is subordinate, dependent or peripheral to that of developed countries mainly because of hierarchical economic relations, as evidenced in the capital flows resulting from these economic processes and the dealings of international financial institutions with developing countries. Development studies have argued that this subordination and dependency are a natural consequence of the 'uneven development' of global capitalism (Bernards, 2024).

Powell mentions that financialisation in periphery countries is distinct due to their subordinate position relative to the core countries (Powell, 2013). This concept is critical in this research when discussing the concept of currency hierarchies. Lapavitsas (2009) highlights the rise of the US\$ as the world's quasi-currency; therefore, international capital flows mean emerging countries, such as Kenya, or companies operating in Kenya mainly borrow in US\$ or other foreign currencies. Although this strategy decreases the risk for advanced capitalistic economies in transferring their surplus, it furthers monetary and financial subordination (Bonizzi, Kaltenbrunner and Powell, 2022). Bonizzi's earlier work highlights that, given the weaker position of emerging markets or periphery countries, substantial increases in foreign capital flows are potentially a source of instability (Bonizzi, 2013). The experiences of emerging countries are contingent on their position in the "uneven hierarchy of classes and nation-states", which limits the agency of both private and public actors (Bonizzi et al., 2022, p. 678). This concept of subordination is useful in this research

when discussing one of the critical challenges of foreign capital flows: the FX risk. Kenya, an emerging market, and its currency – a store of its value – are subordinate to most currencies from developed countries from which it borrows capital. As a result, Kenya's reliance on global capital flows makes the country vulnerable and subject to the volatility cycles of global liquidity. Since subordination is accepted as the status quo, countries continue enabling international capital flows through regulatory reforms.

2.2.3 Financialisation Through Regulation

The regulation theories perspective holds that a set of institutions and policies are necessary to create, mobilise, normalise, stabilise and operate a regime of accumulation effectively (Bonizzi, 2013; French, Leyshon and Wainwright, 2011; Hudson, 2008). They provide a legal, political and cultural shift that bolsters economic and social reproduction. The relationship between policy shifts and financialisation in developing countries is a core part of this research. The influence and role of international multilateral banks, such as the World Bank and the International Monetary Fund (IMF), in advocating, enabling and financing the shift in macroeconomic policies, such as the Washington Consensus era, has previously been analysed (Turkelli, 2022; Bonizzi, Kaltenbrunner and Powell, 2022). International multilateral banks are credited with favouring structural adjustments that led developing countries to embrace ideological and policy shifts that empower private capital. Hudson (2008) highlights that the regulationist view maintains that institutional and policy support are essential to the efficient functioning of the market and to avert crises. The view postulates that markets are not self-equilibrating systems; they need institutions for the effective reproduction of capitalist economies. This concept has been contested by accumulation scholars, who have asserted that capitalistic economies are inherently vulnerable to crises, rejecting the idea that regulations could avert crises such as those experienced in 2008 due to the subprime mortgage crisis. Although regulation theories sometimes focus on the state's role in enabling financialisation, corporate firms are formidable agents of financialisation.

In addition to the three conceptualisations of financialisation applicable to this research, other aspects, such as financialisation as a governance value-based tool and the financialisation of everyday lives, have been studied thoroughly. The former focuses on

studies pertaining to the prioritisation of shareholders and the organisation and structuring of corporate governance to provide maximum returns (profitability) to shareholders in dividends and share value appreciation, some of which can only be achieved through ‘alchemic transformation’(Aalbers, 2019; Grafe and Mieg, 2019). Some scholars have observed that shareholders expect financial markets to provide high returns in double digits relative to the single-digit expectations in real product markets(French, Leyshon and Wainwright, 2011; Froud et al., 2000). A consistent critique of shareholder value is its inclination towards ‘short-termism’, with investors keen to achieve returns sooner rather than later, often at the expense of the viability of a company and its social and environmental impact (Klagge and Nweke-Eze, 2020).

The financialisation of everyday lives explores the embeddedness of the financial world in people’s quotidian routines (French, Leyshon and Wainwright, 2011). This scholarly body of work has focused on the proliferation and expansion of the financial ownership of HHs and individuals (van der Zwan, 2014). On the one hand, the financialisation of everyday lives highlights the permeation of the middle class with spare savings entrusted to FIs to invest in their stead, but it also examines the increase of credit and debt in the daily lives of populations. Mawdsley (2018) states that, sadly, HHs in the Global South have now joined the North in its stress over credit and borrowing struggles. In particular, and related to finance and energy in the Global South, Baker (2023) identifies electricity provision as the new site of finance-led capital accumulation. Baker claims that, in Kenya and other SSA countries, electricity provision through a ‘*distributed cost approach*’ to low-income HHs via financial inclusion mechanisms, such as PAY-GO, has transformed into “a cashflow, a financial asset, a conduit for consumer debt and a mechanism for the acquisition of consumer data”(Baker, 2023, p. 208). This approach has also been used to study the geographies of debt at the HH level in other sectors (Green, 2024).

This section explored the theoretical framework of financialisation, discussing its broad application and conceptualisation. The next section links the theoretical framework to the energy sector in Kenya.

2.3 Linking Financialisation to the Energy Sector in Kenya

The previous section outlined three conceptualisations of the normative theoretical framework of financialisation: a regime of accumulation, the role of regulations and policies in enabling financialisation, and the relational power dynamics of subordinate financialisation. The section below outlines how the conceptualisations apply to Kenya and, specifically, the energy sector.

This research adopts Epstein's definition of financialisation, which describes the growing prominence of financial markets, institutions, elites and their governing organisations in the functioning of the economy, both locally and internationally (Epstein, 2005). This concept covers many analytical parameters, such as structures, processes, epochs, practices, measurements, outcomes, effects and relational connections, analysed at different scales in different time scales (Aalbers, 2019; Sawyer, 2013). Therefore, the concept applies to Kenya's energy sector and can be used to discuss its actors, practices (logic, instruments and measurements), relations (interactions and connections) and outcomes. Hence, this research applies the concept of financialisation to underlie its understanding of the energy market in Kenya and explain its characteristics. The following paragraphs outline the understanding of financialisation within the context of Kenya and sustainable development, which constitutes sectors such as energy, and its applicability to capital access and provision.

This research establishes that because Kenya is part of global capital circuits, it is ineluctably characterised, influenced or shaped by financialisation. Furthermore, due to the country's admission of its need for (and access to) international finance, the rise of the private sector in the energy sector, and the technological and financial innovation that has led to the penetration of off-grid energy access, all these three aspects are as a result of financialisation or, at the very least, have reinforced it. Therefore, Kenya's financing of sustainable development and climate-relevant sectors, such as the energy sector, is done within the nexus of development and financialisation.

Collectively, the current financialisation in the country is shaped by the global dynamics of international finance, the broad global culture of accumulation, the corporate prioritisation

of shareholders, and financialisation practices at the HH and individual levels. Hence, this research views financialisation in Kenya as an ever-growing cyclical loop of concurrent inputs and outcomes actualised by actors who further its practices, logic and rationales. Furthermore, the global waves of financialisation practices are often transferred to subordinate countries. For instance, the global narratives of private-led development built a new global accumulation culture imported to subordinate countries via their access to international capital, which can be conditional or contingent on policy and regulation reform. These policy reforms and practices are then enacted to increase capital flows, resulting in an unintentional financialisation or, at the very least, adoption of some of its practices.

Distinct from previous research, such as Klagge and Nweke-Eze(2020). This present study does not seek to answer the extent to which Kenya's economy or the energy sector is financialised. This complex and contested issue is often answered (subjectively) relative to interpretation, perspective and approach; instead, this research uses the theoretical context of financialisation as a starting premise to understand capital access for the energy sector. Hence, this study does not investigate whether Kenya is financialised, its extent or its pace. This study postulates that Kenya embodies many characteristics of financialisation (conceptual and empirical), and its access to capital (nationally or at the corporate level) is unavoidably subject to its actors, practices, logic, measurements, effects and outcomes. Hence, the research adopts the broad understanding of financialisation because it argues that Kenya and its energy sector are both subjects and enablers of financialisation; corporate companies are the vehicles and agents of financialisation; and HHs are the targeted consumers, and they are often beneficiaries but also, at times, victims. Due to the breadth of the financialisation context, Sawyer (2013) advises that it is important to distinguish each financialisation analysis with the period and geographical space, since without these, the broad definitions do not provide the analytical framework for studying (forms of) financialisation. This point is key, because it calls for a tailored and contextual application to Kenya's energy sector and its access to capital.

The following section discusses financialisation characteristics presumed as normative or applicable to Kenya in its attempt to create an environment in which actors and firms provide or access capital for the energy sector.

2.3.1 Kenya's Context: Financialisation Assumptions

This section outlines the consequential and applicable financialisation characteristics in Kenya's energy sector. These characteristics are broken down into four conceptualisations: a regime of accumulation, the rise of shareholder value (corporate level), regulations and subordination.

This section deconstructs the research's perspective on financialisation and its applicability to Kenya, particularly the energy sector and capital access. It adopts the understanding that financialisation is a regime of accumulation at global and national levels. Although this study concurs with Marxist and structuralist theorists regarding the influence of external pressures in shaping financialisation in countries, it also acknowledges the integral role of domestic actors and institutions in setting strategy and regulation and enabling financialisation. However, some have argued that such domestic actors have limited agency (Bonizzi, Kaltenbrunner and Powell, 2022). Nonetheless, this research believes Kenya operates within the broader global financialisation trends and global capital circuits, and most importantly, its liberalised hybrid energy market allows for private sector participation that provides investment channels that absorb domestic and foreign financial flows.

As with many other emerging capitalistic economies, Kenya experiences variegated and distinct financialisation. Although not '*financialised*' in the same way as the advanced (core) capitalistic economies, some of Kenya's key characteristics are present in its emerging markets. This research postulates that, in Kenya, there is increased importance, flow and growth of finance at the national, corporate and household levels, particularly in the energy markets. At the national level, the government provides domestic public finance and collaborates with international public institutions to de-risk private sector investments and increase capital flows for development (The National Treasury, Climate Policy Initiative and The Kenya Climate Innovation Centre, 2021). The energy sector is one of the beneficiaries of

this strategy; therefore, it is experiencing a financialised-centric vision of development. Hence, arguably, global financialisation trends impact emerging markets in their pursuit of development or, better yet, in their financing.

This research views corporate firms (investors) and energy companies as prioritising shareholder value-based governance, aiming to maximise returns through asset pricing and dividend payments. To achieve this target, managers are incentivised through performance-based remuneration tied to stock performance. For energy companies, increased financialisation is growing through assetisation⁷ and increased reliance on capital markets, with some diversifying debt provision from energy services to include other services and goods to HHs and individuals (Baker, 2023). As such, this research perceives corporate firms as channels through which the transference of financialisation practices, logic and narratives occurs, often from international foreign investors to domestic local markets, becoming implementing agents of financialisation. Similarly, energy companies in Kenya are increasingly securitising, especially those in off-grid energy markets. Baker (2023) provides the example of BBOXX, one of the largest off-grid companies in Kenya and Africa, mentioning that the company created a special purpose vehicle (SPV), bundled 2500 customer contracts into asset-backed notes, and sold them to Oikocredit, raising £500,000.

This research uses the concept of financialisation to discuss actors, practices (logic, instruments and measurements), relations (interactions and connections) and outcomes. The study agrees with Epstein's definition that, more than ever, financial markets, actors and institutions play a significant role and have power and influence. The question of whether the energy sector in Kenya is financialised is one that few have attempted to answer. Klagge and Nweke-Eze (2020) are the only scholars who have attempted to answer this question in the Kenyan context, focusing on large energy infrastructure projects. Equity ownership was the researchers' key defining element of financialisation. They concluded that large infrastructure projects in Kenya were not financialised because they were not traded in stock exchanges or owned by institutional investors or financialised firms. This thesis adopts a

⁷ The process that bundles financial assets, such as debt, into securities sold to investors to generate immediate income for firms and interest for new buyers.

different approach to financialisation by examining the evolution of the energy sector and its financing to understand the foundational regulatory blocks of liberalising energy markets, the increase of private sector participation and, consequently, an increase in capital flows. Regarding energy generation, Kenya historically relied on international financing to construct hydropower plants before its shift to public-private partnerships PPPs (Newell and Phillips, 2016). Regarding energy distribution, the country partially privatised the national utility company that distributes electricity, and more recently, it has relied on private markets for distributed off-grid systems. Therefore, since the energy sector is the most financed in Kenya, attracting significant local and international financing, this research argues that it is subject to financialisation. Furthermore, Kenya's energy sector lead resulted from substantial institutional, policy and regulatory restructuring. In Kenya, the 1990s energy market liberalisation, facilitated by the World Bank via financing of \$700 million, was focused on legal and regulatory reforms to attract private sector participation in the energy market (Godinho and Eberhard, 2019). Coupled with the country's political will, this strategy attracted off-grid companies, private project developers and the investments needed for their success.

This research concludes that the energy sector in Kenya operates and is embedded in a financialised ecosystem, leading to financialised practices, logic and measurements. Furthermore, Kenya has active collaborations between public and private sectors, with international public institutions, such as DFIs and MDBs, providing fundraising risk management tools, such as guarantees and advisory services, to enable more private capital. This conclusion aligns with the scholarly body of work that has focused on the nexus of financialisation and development, highlighting the subservient role of public finance in catalysing and mobilising private sector finance (Taggart and Power, 2024; Bougrea, 2024; Karwowski, 2021; Bracking and Leffel, 2021; Mawdsley, 2018). Moreover, international public institutions supported market liberalisation policies that included the private sector in energy service provision. The stark reality is that countries in the Global South direly need more capital to finance their development or climate resilience, most of which they highlight must come from international sources. Most of these are admittedly published in countries'

NDC reports. If sustainable development is to be achieved, as well as climate change goals met, it will continue to be financed by international capital, most of it debt.

A dilemma exists because, on the one hand, debt bridges financial gaps, yet on the other hand, it leads to debt entrapment (Christopherson, Martin and Pollard, 2013; Dymski, 2018). Dymski describes this phenomenon best: “So finance is seen both as functionalist and as potentially dysfunctional: both a means of resolving one set of contradictions (financing gaps) and the source of another (debt repayment gaps)” (2018, p. 3). He further highlights that a precondition to the economic crisis is characterised by the cyclical increases of borrowing with promises to repay without a keen assessment of the repayment ability. This situation has plagued many SSA countries, including Kenya. In 2024, Kenya and 16 other countries in SSA received credit rating downgrades because of increased debt (Climate Policy Initiative, 2024). Today, investors perceive Kenya as debt-distressed, with a high possibility of default, and with this risk priced to the capital, the cost of capital increases. The capricious capital flows to emerging economies with its financialisation influences. Arguably, it is a package deal; capital comes from its sources along with its actors and practices to the emerging markets.

Table 3 summarises how financialisation and its different conceptualisations relate to Kenya’s energy sector and its pursuit of capital.

Table 3: Financialisation Context in Kenya

Financialisation Conceptualisation	Key Assumption	References
A Regime of Accumulation	1. Globally, a financialisation-centric vision of development has a central focus on the private sector, with the public sector, e.g., MDBs working with firms and countries to enable, de-risk, and attract private investments, transforming aid into investment. Kenya, as a country in the Global South, works to align itself with global trends in capital and development markets to access capital.	(Bougrea, 2024; Taggart and Power, 2024; Mawdsley, 2018; Gabor, 2021)
	2. There is an increased foreign investment flow to foreign and local domestic firms, providing debt or buying stocks in the companies. Though not a singular force in transforming institutions and practices, they contribute significantly due to the power balances between the Global North (sources) and the Global South (recipients). This research assumes that, given Kenya’s pursuit of more capital flows to its economy from international sources, this entails certain	(van der Zwan, 2014)

	practices, rationales, governing structures, measurements and processes.	
	3. The (negative) effects of financialisation in developing countries include financial volatility, vulnerability to boom-and-bust cycles of capitalistic economic systems and exchange rate volatility. At a state level, increased borrowing increases vulnerability.	(van der Zwan, 2014; Dymski, 2018)
Rise of Shareholder Value	1. This concept prioritises shareholder value above other stakeholders or economic, social and environmental goals. Although this assumption should not be applied broadly across all companies, this research assumes that, for companies in the energy sector, while pursuing environmental, economic and development goals, financial value remains the top priority.	(Sawyer, 2013)
	2. Assetisation and securitisation: These concepts include bundling commodities and transforming them into tradeable financial assets, for example, the sale of carbon credits. Although at this scale, this process is harmless and does not affect the economy, Baker highlights this as an emerging financialisation of the off-grid energy provision sector.	(Aalbers, 2019; Baker, 2023)
Regulation Role	Energy markets shifted their policies and regulations to enable private sector participation. This shift was necessary because financial or other markets (in this case, energy markets) are imagined, mobilised, enacted and institutionalised. This point illustrates the critical role of regulatory reform in building energy markets, enabling the flow of investments to companies in this sector in Kenya.	(Aalbers, 2019; Newell and Phillips, 2016)
Subordinate Financialisation	As with many other countries in SSA, Kenya is categorised as an emerging capitalistic economy. Hence, Kenya is subordinate to advanced capitalistic economies in the hierarchy of currencies. International finance flows are a critical source of capital for financing development projects in emerging economies. However, because capital is often provided in the lender's currency, emerging economies are exposed to FX risk. Given the dominance of the US\$ in global capital circuits, countries in the Global South can rarely borrow in their own currency.	(Bonizzi, Kaltenbrunner and Powell, 2022; Lapavitsas, 2009)

Although empirically, this research narrowly focuses on access to capital for the energy sector in Kenya, it recognises that it is part of a broader global capital flow. Therefore, it is fundamentally shaped and influenced by the global development and climate finance narratives. This research does not evaluate whether Kenya and, by extension, its energy sector, are subject to financialised development but rather accepts this to be the case. Therefore, this study uses the broader umbrella of financialisation to discuss the diverse actors, financial practices (logics and measurements) and outcomes.

As highlighted in the discussion above, although this research adopts a broad perspective of an ever-increasingly financialised ecosystem within which Kenya's energy market operates, this research neither focuses on the global nor the national financial markets in totality, but the financial ecology of the energy market in Kenya. The research adopts the concept of financial ecologies to study actors, practices, logic and narratives. This study applies the theoretical framework of financialisation to understand and discuss capital access for ETA in Kenya, and it utilises the analytical concepts of financial ecologies and calculative practices. The next section discusses the concept of financial ecologies and how it establishes the analytical framework for this research.

2.4 Applying Financial Ecologies and Calculative Practices Concepts to Financialisation

2.4.1 Financial Ecologies of Kenya's Energy Sector

This section builds on the theoretical concept of financialisation by using the analytical tools of financial ecologies to understand capital access for the energy sector in Kenya. The discussion heeds French et al.'s emphasis that research on financialisation is profoundly spatial, yet space and place are barely considered (2011). Thus, this research applies this concept to understand the distinctive financial ecology of Kenya's energy markets while being resonant with the broader global financialisation contexts within which they are embedded.

The analytical concept of financial ecologies helps focus the attention of the research from a broad Marxist global focus on financialisation to studying capital access in a specific country and sector, narrowing the focus to a specific space and place. However, this approach does not disregard the global effects, influences and outcomes that affect capital access but studies them from the perspective of a contextualised space and place: Kenya's energy market. Echoing French et al. (2011), Green (2024) highlights that financial ecologies are distinct from the Marxist financialisation theories because they attribute theoretical weights to global logics of capital circulation, whereas financial ecologies seek to study financial systems in fragmentation. French determines that this fragmentation, which studies financial systems at the level of ecologies, helps identify "individual points of leverage, ways into the system,

and avenues of intervention”(Leyshon et al., 2004; French, Leyshon and Wainwright, 2011, p. 812). In essence, it is easier to identify impactful lessons for improvement and implementation when analysing small units of financial systems.

The concept of financial ecologies was initially applied by Leyshon et al., influenced by earlier studies in the field of science and technology that attempted to ascribe ecological properties to social arrangements (Leyshon et al., 2004). Explicitly referencing Nardi and O'Day (1999), Leyshon et al. adopted the biological ecology metaphor to conjure imagery of the “complex dynamics, diverse species and opportunistic niches for growth” and draw parallels to the financial systems (Leyshon et al., 2004, p. 626). From this, the researchers argued that financial systems comprise small and constitutive ecologies. Within these ecologies, relational connections between actors and institutions unfold practices and competencies that evolve distinctively across space relative to geographical differences, leading to distinctive ecologies. Thus, in the concept of financial ecologies, actors (financial, policy, industry and research) are like flora and Fauna, whereas the variegation of culture, policy, regulation, political will, technological infrastructure, financial position and national macroeconomics form the “ecosystem” in which connections and practices form distinctive financial ecologies (Green, 2024). In this case, it forms a unique energy financial ecology in Kenya.

The concept of financial ecology has been used to study the increased indebtedness of consumers, the financialisation of urban infrastructure and geographies of debt, and the everyday engagement of HHs and financial services (Burton, 2020; Grafe and Mieg, 2019; Green, 2024; Coppock, 2013). As recommended by French (2011), these subjects have all been studied within a specific space and place and, at times, had a sectoral focus, such as fintech, agriculture or urbanisation.

The underpinning core facets of the financial ecologies are actors, place and relations (Leyshon et al., 2004; Burton, 2020; Green, 2024). The first facet of actors involves understanding who they are and how they operate within an ecology. Place highlights the geographical location and the distinctive economic and political environment in which the

actors interact. Relations concern the interconnections, arrangements and interactions of the actors. To understand the relations and outcomes, one must explore the overlapping and constitutive connections between the actors and their practices. The facet of place provides a distinctive locational and situational context to the study, which is the energy market in Kenya. This research uses the other two facets to answer the following research questions.

Regarding the first facet of actors, this study asks the following research questions (RQs): 1) Who are the influential actors enabling capital access in the energy sector in Kenya, and how do they invest? To answer this, the research uses the quantitative datasets of IRENA and GOGLA to identify the most influential public and private investors, recipients, capital flows and trends, and instruments used to invest to reveal the actors, their practices and the (uneven) investment outcomes in the Kenyan energy markets.

Regarding relations, this study asks the second and third key RQs: What factors control investment decision-making? What kinds of investments (if any) promote sustainability? To answer the second question, this facet helps us understand actors' industry-accepted norms and practices and the firm-level decision-making control factors used to determine the selection and evaluation of projects and companies. Furthermore, this facet provides an overview of actors' connections, partnerships and overlapping and constitutive roles in facilitating access to finance. The third RQ broadly concerns the industry and firm-level factors that lead to the (uneven) investment outcomes identified in RQ 1.

In examining the causative factors of the (uneven) investment outcome informed by the second RQ, this study asks how these investment outcomes can be improved, which leads to the third RQ: What kind of investments (if any) promote sustainability? This question combines the financial investment outcomes of RQ 1 and the financing needs and challenges identified in RQ 2 and applies calculative practices (to create an index) to demonstrate the expansion of capital access outlook and its potential application in the industry. This index is mainly an 'avenue of intervention' due to the narrow focus on Kenya's '*energy market financial ecology*'. To achieve this, the research employs the concept of calculative practices used in sustainability accounting.

2.4.2 Calculative Practices and Decision-Making for Energy Investment

Against the theoretical background of financialisation, particularly at the corporate level and its application as a governance tool prioritising shareholder value creation, this research employs calculative practices to broaden the outlook regarding capital access. As part of answering RQ 2, which focuses on the factors that control investment decision-making, the research analyses the relationship between impact/Environmental, Social and Governance (ESG) reporting and its influence on capital access. Hiss termed this phenomenon the “financialisation of sustainability” (Hiss, 2013). Impact and ESG reporting are the evidencing of a company’s outcomes and results from their tasks and activities towards the broader social, environmental and economic goals aligned to sustainable development targets. Although sustainability plays a critical role in the fundraising process at the firm level, this research applies the concept of calculative practices at the sectoral level to create, measure and evaluate the sustainability of capital provision by investors in Kenya’s financial ecology of the energy sector. This section discusses the application of calculative practices to capture the sustainability of capital provision and access.

This concept is greatly influenced by Hiss’s 2013 work on the financialisation of sustainability and its politics, which states that the financialisation of sustainability, often used in sustainability accounting, coalesces non-financial metrics, such as ESG elements, into financial accounting mechanisms, linking them to the structures and rules of financial markets. Hiss’s work mainly focuses on the evolving calculative practices of sustainability and integrating sustainability factors into financial accounting. This foundational study provides a background to the financialisation of sustainability, as well as the utility and limitations of calculative practices. Hiss states that “calculative practices enable the definition, determination, categorisation, measurement and standardisation of objects” (Hiss, 2013, p. 235). This present research utilises Hiss’s work on the integration processes to design, construct, assess and evaluate the sustainability of capital access for energy markets in Kenya.

Calculative practices enable one to determine key performance indicators (KPIs), which simplify complex qualitative and quantitative phenomena into consistent single-number

units that are measurable, comparable and standardised. The goal of simplifying and aggregating multiple factors into an index is to provide an evaluative metric that aids decision-making regarding capital provision. The motivation is twofold: to encourage investors to invest in a manner that bolsters industry growth and incentivise, and to reward investors with sustainable investment practices during capital-raising. The use of quantitative KPIs is consistent with the preference and the practice of financial market actors in deciding their direct investments (Hiss, 2013). This research argues that a strong relationship exists between sustainability and investment decision-making for energy companies and investors. Hence, in practice, sustainability is already operationalised in different formats. Therefore, this research contributes by providing a capital access sustainability index to inform investors' investment decision-making and incentivise impactful capital provision, minimising struggle and uneven investment outcomes.

Calculative practices enable one to identify, count, measure and quantify sustainability, providing transparency and visibility and simplifying decision-making. By creating an index to assess capital access and provision, this research broadens the understanding of capital access to include more indicators, making previously unconsidered factors visible. This process also simplifies by aggregating all the indicators into an index, providing a number for ease of interpretation, ranking and informing decisions. The other great advantage of aggregating capital access factors into an index is that it captures a singular composite view of amalgamated factors that would otherwise be mentally challenging to synthesise, compute and rank instantaneously due to the large volumes of data and categories.

An index also shifts the discussion of investor contribution from inherently pervasive and deeply embedded speculative practices to evidence-based calculative practices that attempt to reflect the factual dynamics of capital provision. Ultimately, this research recognises composite indices' utility in making comparison easy, a precondition for embedding "situations and organisations in a comprehensive global social order" (Hiss, 2013, p. 240). The research encourages and incentivises a form of private corporate governance because it recognises sustainability's vital role in access to capital for different actors. Hence, acting is a counterforce to balance the extreme financialisation practices that solely prioritise economic

activities to achieve shareholder value. However, this approach is not without its limitations or disadvantages.

Generally, numbers, indicators and metrics are used as an objective transparency vehicle for qualitative and complex phenomena; however, this is not always the case (Ababneh and Ağa, 2019). As highlighted by Hiss, indicators developed in sustainability accounting are formed from assumptions and hypotheses and are subject to different definitions of sustainability (2013). Therefore, results are as variable as the assumptions and hypotheses applied. Hiss further highlights that although some indicators are given visibility, others are eclipsed, which may include sustainability aspects that cannot be quantified or those with data access or quality challenges. Data access is, and remains, one of the critical challenges for measuring the impact of investor contribution to capital provision, access, and distribution; consequently, certain aspects are eclipsed. The other limitation is that, once certain KPIs are industry-accepted, companies become reactive by only improving and documenting measurable KPIs and are no longer proactive regarding unquantifiable and invisible aspects. This effect is because the industry mainly rewards based on the industry-accepted KPIs. Hence, some have advocated for sustainability outcomes to be included alongside financial ones (Wahyuni et al., 2024; Schaltegger, Etxeberria and Ortas, 2017).

Although different actors formulate and construct KPIs, some actors are more influential than others. Hiss highlights that institutional investors greatly influence the framing of indicators and may represent their interests, which can favour financial outcomes (2013). Hence, some interests are represented, while others are omitted. Many studies have called for a thorough inclusion of stakeholders for greater representation in sustainability metrics (Kaur and Lodhia, 2018; Bellucci et al., 2019).

Notwithstanding these limitations, the use of calculative practices provides a comprehensive composite outlook that increases the breadth of capital access, incentivises impactful capital provision and is a great tool for improving decision-making. In place of speculation, this approach adds *subjective objectivity*. Although calculative practices in sustainability are subject to the logic of financial markets, this may be the only option. Without this approach,

sustainability may be neglected and result in a lack of tools that bring sustainability within the decision-making sphere of investors and corporate firms because “financial actors direct their capital flow on the basis of these indicators” (Hiss, 2013, p. 243). Since the goal is twofold, to ensure the flow of capital access and its sustainability, this research is broadly influenced by Hiss’s three stages of sustainable accounting to conceptualise, construct and evaluate capital access. Hiss’s three stages of sustainability accounting are the framing of indicators, the construction of indicators and financial marketisation.

This research takes the position that Kenya and its energy sector operate within the broader financialised system in which financial logic, measurement tools, and narratives have globally permeated development financing. The use of narratives and sustainability metrics as fundraising tools has become common practice in capital accessibility and provision, and is undoubtedly a decision-making tool. Hiss highlights that financial logic is applied to sustainability, and although this has many intrinsic weaknesses, it is the pathway to ensuring consensus, targeted intervention and a keen focus on sustainability in addition to the expected financial outcomes. As such, this research acknowledges that financial logic and practices prevail as long as investments are made with a desire for maximum returns. The concept of calculative practices is used as one of the checks and balances of a complex financial ecology by bringing visibility to specific components of financialised narratives. This practice also encourages financial actors to invest impactfully by maximising stakeholder impact without neglecting shareholders' profitability. Indices are important in foregrounding aggregated firm and industry factors to assess outcomes and ranking. Equally important, indices provide evidence-based performance data to narratives of development financing, enabling sustainability monitoring and minimising speculative practices, and linking financialisation to sustainability. The next section synthesises the link between financialisation, financial ecologies and calculative practices.

Table 4: A summary of financialisation / financial ecologies facets and their relation to the research

Financialisation/ Financial Ecologies Facets	Actors	Practices	Relations
Definition	These are the key stakeholders, mainly financial providers and	The rationale, logic, instruments, and measurements that financialisation actors use	The interactions and connections among the actors further enable their practices in

	recipients	to provide capital, including calculative practices.	providing and receiving capital.
Research Questions (RQs)	RQ 1: Who are the influential actors enabling capital access in the energy sector in Kenya, and in which way do they invest?	RQ 1: Who are the influential actors enabling capital access in the energy sector in Kenya, and in which way do they invest? RQ 2: What factors control investment decision-making? RQ 3: What kinds of investments promote sustainability?	RQ 2: What factors control investment decision-making?
Purpose	It showcases influential public and private investors as well as striving and struggling energy companies.	This facet helps us understand actors' industry-accepted norms and practices and the firm-level decision-making control factors used to determine the selection and evaluation of projects and companies.	This is one of the factors explored to understand how actors' interactions through partnerships and collaborations influence or shape capital provision.
Chapters	4,5	6,7	6

2.5 Conclusion

This chapter provided the context of Kenya's energy sector, the theoretical framework of financialisation, and its application to Kenya's energy markets. The discussion applied the conceptual framework of financial ecologies and calculative practices to explore capital provision and access for the energy sector in Kenya. The concept of financial ecologies was employed to understand actors, practices, relational connections and partnerships that facilitate capital access. The concept of calculative practices in sustainability accounting was discussed to understand the linkage between sustainability and capital access, its role and how it can be operationalised to broaden the outlook on capital access. The chapter divided the discussion into three key sections: the theoretical background of financialisation and its application to Kenya's energy sector; the use of financial ecologies as an analytical framework to explore actors and relational connections; and the use of calculative practices in sustainability accounting to reconceptualise capital access. Consecutively, these three sections are summarised below.

The first section outlined an in-depth contextual background of the financialisation on which Kenya's energy sector is embedded and operates. This theoretical background was applied to explain capital access, establishing that, at the global level, there is growing prominence, power, proliferation and penetration of the financial market and, commensurately, its actors, logic, practices, measurements and narratives, all of which flow into state, firm and HH levels. Consequently, Kenya operates within a broader accumulation regime of financialisation, mainly because, historically and presently, it relies on international foreign capital flows (from *financialised economies*) to finance its development sectors (including the energy sector). Beholden to these capital sources, the country buys into a financialisation-centric development vision with a central focus on the private sector. As a result, the public sector (foreign and domestic) focuses on derisking private investments, leading to an increase in foreign investment flow to both local and foreign firms, which raises profit-making through financial investments, expanding the rentier class.

Although increased foreign investments (debt and equity) fill the financing gap, they also tie local economies to the volatile global economies and increase vulnerability due to FX risk and debt entrapment. This situation is partly related to the subordination of emerging economies to the financialised economies in the hierarchy of currencies. At the national level, the government and domestic actors establish regulatory and institutional frameworks to enable the operation of both investors and industry firms. In Kenya, the government, supported by the World Bank, facilitated market liberalisation through regulatory and legal reforms to enable the operation of the private sector in the energy markets.

The participation of private energy companies linked the sector to private institutional investors and provided an additional investment channel for public multilateral institutions. This situation led to increased access to finance from international capital markets in a shift away from traditional banks. The private industry actors (energy companies and investors), who are both subjects and agents of financialisation, play a critical role. These actors operationalise financial market logic, practices and measurements as the vehicle of investment outcomes and narratives. As a result, these actors have a natural inclination to

employ corporate governance approaches that prioritise the interests of shareholders over other stakeholders, working to maximise value through dividend payments and stock appreciation. The research then turned to the concept of financial ecologies.

The concept of financial ecologies was applied to study a distinctive space and place while being attuned to the broader global trends, influences and outcomes of financialisation. The use of the concept was in response to French's (2011) call to study financialisation through a perspective of a place and space, given the distinctive economic and political environment in which the actors interact. This usage established that this research focuses on the financial ecology of energy markets in Kenya and emphasised the three critical facets of financial ecologies: actors, practices and relations. The usage further linked the concept of financial ecologies with the research aim and questions: to identify and foreground influential actors in capital access, their practices, connections and interactions. Due to the concept's narrow and fragmented nature, it provides the research with a keen focus to identify avenues of intervention. The research then turned to the concept of calculative practices of sustainability accounting to broaden the capital access perspective.

This section discussed the link between financialisation and calculative practices. Calculative practices are often applied to sustainability accounting to integrate non-financial metrics into the decision-making structures of financial markets. This process may include ESG impact metrics. The research highlighted that, despite the many flaws of calculative practices, it is a fundamental tool for ensuring sustainability is not ignored, or that the singular interests of the most influential actors do not override climate and development pursuits. Cognisant of the concept's limitations and utility, this research applied it for three reasons: as a response to financialisation practices (corporate governance approach) at the firm level that inherently have a disposition of prioritising shareholder value; to illustrate that capital access and provision is broader and complex than the simplistic view of the quantity and the volume of investment flows and; provide a tool that brings visibility to neglected aspects of capital access whilst providing measurability to consequential narratives that influence investment decision making. This concept is applied explicitly in the third empirical chapter to build an

index guided by the established principles to measure, assess and evaluate capital access at the firm level.

This chapter outlined the context for Kenya's energy sector and the theoretical background for this thesis. The discussion described how financialisation can provide a contextual background for studying the actors, practices and outcomes of the energy financial ecologies in Kenya. The chapter suggested the application of financial ecologies to study capital access due to the concept's consideration of geography: space and place. The chapter closed by applying the concept of calculative practices to highlight its utility in sustainability accounting. Having outlined the theoretical and conceptual framework for this thesis, the next chapter discusses the methodological approach used in this research.

Chapter 3: Methodology

Chapter 3 presents the methodological approach and discusses the selection of methods to investigate capital access challenges, gaps, and needs of the emerging markets in SSA, particularly through the analysis of energy sector financing in Kenya. The key facets of financial ecologies relevant to this thesis guide the methodological approach: financialisation actors, practices, and relations. This approach addresses who the influential actors are, how they invest, the factors that control their investment decision-making, and what kinds of investments promote sustainability in capital access.

The theoretical underpinning of this thesis in financialisation influences the methodology approach, sequence of analysis and results interpretation. First, the theoretical assumption that capital access for emerging markets is embedded within the broader framings of development and climate finance indicates an intricate relationship between the wider global capital circuits (structural systems) and the practices and relations of financialisation actors at the local and national levels (Mawdsley, 2018). The approach considers the cyclic and reciprocal relationship between the everyday practices of actors and the broader global structural systems. Jones and Murphy (2011) have pointed out that everyday practices of actors enact, transform and reproduce broader structures and institutions. For this thesis, it is important to understand the investment outcomes (patterns and trends) from international capital flows, providing a bigger picture context within which the actors operate. Second, the globally accepted ‘financialisation-centric development financing’ model advocates leveraging public finance to increase private investments in emerging markets (Bougrea, 2024; Bracking and Leffel, 2021). The methodology approach, therefore, uses this factor to look at public and private investment outcomes sequentially before looking at actors’ practices and how capital access could be improved. This research uses a mixed-methods approach with two quantitative datasets from IRENA (public investments) and GOGLA (private investments) and qualitative datasets from semi-structured interviews and

documents. During the data collection and analysis stages, analytical memos summarised the researcher's thoughts and reflections on the study.

The first section of this chapter justifies the selection of a mixed-methods approach. It then discusses the philosophical underpinning of a mixed-methods approach and the selection of the pragmatism paradigm. Following this, it discusses the research's methodological evolution. It then lists key research questions and discusses data collection methods, data analysis, and the researcher's positionality.

3.1 Methodological Approach

This thesis uses a mixed-methods approach to answer its research questions. A mixed-methods approach combines qualitative and quantitative approaches at any or all the stages of the research (data collection, analysis or inferential stage). This approach benefits from the compounded complementary strength of each method and draws integrated conclusions greater than the sum of its parts (O'Hanlon, 2018; Creswell, 2015; Woolley, 2009). O'Hanlon (2018) and Creswell (2015) have emphasised that mixed-methods must have at least one qualitative and one quantitative dataset, which are later integrated. This approach is distinct from a multi-method approach, which is purist but has either multiple quantitative or qualitative datasets, but not both, in a research approach. Aside from that difference, Teddlie and Tashakkori (2012; 2010) have stated that the mixed-methods approach allows a researcher to create a responsive research design for the problem identified. Most importantly, it allows researchers to consider the purpose and advantages of selecting a mixed-methods approach instead of a purist 'mono-method'.

O'Hanlon (2018), reviewing the work of Greene et al. (1989), has identified five reasons why researchers select mixed-methods. These reasons include triangulation, complementarity, development, expansion and initiation. A researcher's focus on triangulation includes a comparison of different datasets to either test or improve on consistency, accuracy or credibility, increasing the overall validity. Hammond and Wellington (2013) have also advised that researchers should employ triangulation as an iterative strategy while also

valuing complementarity. Complementarity is the synergistic advantage of integrating qualitative (inductive approaches) and quantitative (deductive approaches), advancing their collective strengths while reducing their weaknesses or covering their gaps. O'Hanlon (2018) has summarised the other reasons as initiation, which uses additional research methods to introduce a novel investigating lens to a research problem; expansion, which extends the scope of a study to gain breadth or depth through the use of different complementary methods; and, finally, development, where one method guides the use of the complementary method, especially in sequential research designs. These benefits are not substitutionary but can be additional. For example, a researcher who starts with the aim of using mixed-methods sequentially naturally benefits from the complementary nature of those two methods, gaining depth and breadth. The philosophical underpinning of mixed has been a subject of fierce debate for decades, with some elements still irreconcilable with others.

3.1.1 Mixed-methods Philosophical Underpinning

Since the 1960s, qualitative and quantitative approaches have undergone many stages of philosophical contestation, mainly known as 'paradigm wars' (Tashakkori and Teddlie, 1998). These fierce debates brought about a shift from purist approaches to mixed-methods. Johnson and Onwuegbuzi (2004) have stated that central to these debates is the relational congruency between philosophy (axiology, ontology and epistemology) and practice (methodology and methods). Qualitative and quantitative approaches have differing ontological and epistemological elements.

The ontological and epistemological differences between qualitative and quantitative approaches stem from their view of reality and the belief in "how we come to know and understand the world" (Hammond and Wellington, 2013, p. 57). These two approaches are seen as dichotomous and offering two world views. The qualitative approach relates to interpretivist or constructivist epistemology, which begins on the basis that reality is subjective. Reality is constructed, contested, and negotiated within groups, depending on their context and experiences. This approach focuses on understanding multiple realities and providing in-depth contextual meanings and participants' nuanced, diverse perspectives (Yilmaz, 2013). The quantitative approach ascribes to the positivist epistemological

framework, which draws heavily from the natural sciences and ascribes to the view that a measurable, objective, and independent reality exists outside of an individual. This approach focuses on statistical analysis to establish causal relationships that are valid and generalisable (Hammond and Wellington, 2013). Due to the stark ontological and epistemological differences between these two approaches, it is no surprise that some social scientists have advocated purist approaches, citing that they provide coherent philosophical and methodological frameworks that do not dilute the robustness of the individual approaches (Igiebor and Okonmah, 2022; Alavi and Håbek, 2016). Those who advocate for purist paradigmatic approaches believe that the underlying ontological and epistemological beliefs are irreconcilable and incompatible (Smith and Heshusius, 1986). However, this has been fiercely debated by the proponents of mixed-methods.

Proponents of integrating qualitative and quantitative approaches, Silverman (2006) with Hammond and Wellington (2013), have called the extreme polarities that criticise this integration as laziness and stubbornness to learn from each other. They are referring to opposition to a mixed-methods approach and the naivety that fails (intentionally or unintentionally) to recognise how each of the approaches draws from each other. Biesta (2012, p. 147) has argued that mixed-methods do not ascribe to a 'principle approach' but rather to a 'pragmatic' one, which is guided by the research objectives, adopting the best way to answer research questions to achieve an 'accurate and adequate' understanding of a study, when it is not possible to achieve that using a purist approach. This is similarly echoed by the scholarly work of Tashakkori and Teddlie (1998, p. 20) and O'Hanlon (2018). Greene (2006) and Johnson et. al. (2007), concluded that mixed-methods broadly encompass reconciliation at the level of practice (methodology and methods) and philosophy (axiology, ontology, and epistemology). However, this conclusion is disputed. The question is whether it is possible (for a mixed-methods approach) to reconcile at the level of philosophy, the practice, or both. While Greene (2006) and Johnson et. al. (2007) have agreed on this issue, Biesta (2010) has disagreed. Biesta strongly suggests separating the epistemological question from those of methods, highlighting that reconciliation of the epistemological positions and assumptions is impossible, yet combining methods at the practice level is unproblematic. Biesta has asserted that it is 'wrong and unhelpful' to make assumptions about a researcher's

epistemological commitment based on their methodological approach. The philosophical contestation of epistemology is far from over. Because of these debates, the mixed-methods approach is isolated, without an 'epistemological and ontological' home, which leads to it being termed the third 'research paradigm' or 'methodological movement' or 'research community' (Teddlie and Tashakkori, 2009, p. 4). As a third community, it has been debated whether to adopt single or multiple worldviews (Creswell and Plano Clark, 2011).

Adopting multiple world views as a philosophical underpinning draws heavily from the work of Greene and Caracelli (1997, p. 8), which takes a dialectical position, arguing that philosophical differences exist and are important, and a researcher should not attempt to 'ignore or reconcile' but rather maintain the integrity of each to advance understanding. Greene (2007) has argued that a researcher's engagement can be at all levels (philosophy and practice), continuously engaging with the dichotomous plurality of a philosophical paradigm to improve the understanding of the investigated phenomenon. The researcher must constantly reflect on those differences and use them to advance research. Other researchers have proposed adopting a single worldview, basing this on 'pragmatism' as a philosophical framing. O'Hanlon (2018) has stated that pragmatism focuses on a study context and the optimal tools for solving or advancing problem investigations. This approach is at times dismissive or intentionally avoids the paradigmatic differences between positivism and interpretivism, focusing on the best way to investigate a social inquiry (Hammond and Wellington, 2013; O'Hanlon, 2018). Hammond and Wellington (2013, p. 126) have stated that 'pragmatists welcome mixed-methods; numbers give meaning to narratives and narratives give meaning to numbers'.

This research takes a pragmatic position. It agrees with the work of Tashakkori and Teddlie (1998), which privileges a researcher's flexibility to be guided by the methodology that best answers the social inquiry. They call it the 'dictatorship of the research question' (Tashakkori and Teddlie, 1998, p. 20). Earlier in 1997, Greene and Caracelli had mentioned that researchers should not be limited or inhibited by paradigms, which are better viewed as descriptive rather than prescriptive. The top priority for research is to focus on selecting the best methods to answer the research questions. This approach aims to be responsive to a

specific social inquiry and to consider the utility of that inquiry. It aims to be relevant. Having adopted pragmatism, the next section explains the methodological evolution of this research in response to key research questions and how this shaped the data collection, analysis and inferential stages.

3.1.2 The Evolution of the Methodological Approach

This thesis was prompted by a desire to study capital access in Kenya through a qualitative research approach, ascribing to an interpretive ontological view by employing a phenomenology method, in particular, transcendental phenomenology. Phenomenology is the study of incidents, occurrences, cases, or situations to learn and understand from a participant's perspective on their experience as it manifests (Berryman, 2019). Transcendental phenomenology values the objective and subjective knowledge of a lived experience because they are intimately integrated (Neubauer, Witkop and Varpio, 2019). Among other data collection methods, interviews, analytic memos and document analysis are commonly used (Berryman, 2019). Expert or professional interviews were intended to be the primary data source.

The interviews began in the Spring of 2023, and by the summer of 2023, transcription and preliminary analysis had started. The researcher's reflections in her analytic memos during the data collection stage consistently showed that the study missed one key component: the broader contextual understanding of capital flows to Kenya's energy sector. It was impossible to understand the multiplicity of interviewees' opinions meaningfully because the data, on the surface, seemed to lack consistency. However, upon further investigation through document analysis, these differences became clearer. Depending on the participants' roles, they had different understandings, experiences, and thoughts on capital access. It was unclear why these differences existed, yet there was some consistency within similar groups. Overall, discussions on public and private investments were different. Hence, the missing puzzle for the research was the lack of a bigger picture of investment trends and outcomes for different capital providers (public or private).

Such differences and similarities exist because public investors play a role distinct from private investors. Private investors see capital access challenges differently from public investors. Energy companies' experiences of capital access varied, depending on their size and whether they operated locally or internationally. To reconcile these differences and to have a more nuanced understanding of the interview data, quantitative datasets were introduced, first, to provide a breadth of understanding on national capital access and, second, to make sense of the variegated experiences of the actors. There was also a realisation that the quantitative dataset would not take a weaker complementary role but would have equal priority. After this realisation, the quantitative and qualitative data collection and analysis were carried out concurrently. Unintentionally, one method guided the use of the other, and consequently, the research gained breadth and benefited from the complementary and triangulation benefits of a mixed-methods approach. The next section lists the research questions for this thesis.

3.2 Research Questions

The research questions investigated in this thesis are:

1. Historical trends: Who are the influential actors enabling capital access in Kenya's energy sector, and in which way do they invest?
2. Facilitating investment access: What factors control investment decision-making for energy investments in Kenya?
3. Investing sustainably: What kinds of investments promote sustainability in capital access?

Studying capital access through the theoretical framework of financialisation, this thesis investigates historical investment outcomes (trends and patterns), actors (investors and energy companies), their practices and relations. The first research question heavily relies on quantitative datasets (public and private investment datasets) supported by qualitative datasets (interviews and documents). The second research question aims to understand investment outcomes through participants' experiences seeking or providing capital. The third research question combines the findings of the first and the second to highlight the

need for sustainability of capital access and demonstrate, through the creation of an index, the kind of investments that promote it. The next section describes the data collection process for this thesis.

3.3 Data Collection

This thesis aimed to collect quantitative and qualitative datasets. Four datasets were collected: public investment data from IRENA, GOGLA private investment data, interview data, and documents. The financialisation-centric model of development and climate finance indicates that public and private finance have complementary roles in increasing capital flows to emerging markets (Bougrea, 2024; The World Bank Group et al., 2015). Thus, obtaining both the public and private investment datasets was imperative to understand capital access within this framework. In addition, the ‘private turn’ of this financing has not always existed, as the literature shows that historically, (international) public capital funded the climate-relevant sectors. This suggests a sequential relationship between public investments and private investments. In other words, because public investments dominated financing long before the ‘private turn’, it is important to study public investments first, understand the patterns of these investments, and then later look at private investments since the former is leveraged to mobilise the latter.

Emerging markets rely heavily on international finance due to being highly indebted or having limited resources (CPI, 2024; Taggart and Power, 2024). These investment datasets show the sources of this capital and the recipients, which helps identify influential actors while revealing how they invested. Interviewing these actors and understanding their practices and relations was also important. As discussed in Section 3.1.2 above, the researcher conducted half of the interviews before obtaining quantitative datasets after reflecting on how best to answer the research questions. This study also collated documents that provided a broader understanding of capital access at a regional, national, or sectoral level, as well as in-depth insight into specific actors. The next subsections dive deeper into each dataset.

3.3.1 Interviews

Interviews are structured, semi-structured, or unstructured interactive conversational accounts between a researcher and a participant, allowing the latter to express in their own words their experiences, thoughts, or feelings about a phenomenon (Hammond and Wellington, 2013). Interviews allow a researcher to gain an understanding of a phenomenon from the interviewees' perspectives and present in-depth nuances of complex social inquiry, revealing the multiplicity and variety of subjective human experiences. Interviews answer the questions of 'how' and 'why' and, beyond this, pursue meaning in the participants' views.

In the pragmatist approach, Tashakkori and Teddlie (1998) have stated that interviews are essential for providing deeper, adaptable, and contextual data accounts, which, when triangulated with other data sources, help validate findings. This process leads to a comprehensive understanding of complex social phenomena. Most importantly, the iterative inductive analysis of interviews allows a researcher to discover new and emerging insights from data that would otherwise be hidden under broad themes or invisible to quantitative deductive approaches. For example (drawn from this thesis), while the literature has highlighted that it is important for emerging markets to formulate policies that enable more capital flows, questions for the interviewees might include, "Does Kenya have policies that support and attract investors into the country?" Some may say yes or no when answering this question and express differing opinions. However, others may bring a new issue about the volatility or instability of the policy environment and how that uncertainty dissuades many from investing in the country. This new and emerging theme provides a deeper and richer understanding of the policy environment in Kenya. The researcher conducted semi-structured interviews to allow a dynamic interview shaped by both the researcher and the participant.

The researcher conducted 33 semi-structured interviews. The interviews were 60–90 minutes long. The length of the interview allowed for depth (sufficient time to discuss, challenge and follow up on new emerging points of discussion). The number of interviewees achieved adequacy. This ensured that a point of saturation was reached where no new information was revealed during the interview process. Saturation is a test of adequacy (Guest, Bunce and Johnson, 2006). In 2006, Guest, Bunce and Johnson's seminal work measuring variability

and saturation in interview data highlighted that, in a homogeneous group, twelve interviews would be sufficient to achieve saturation. However, more would be needed if interviewing a heterogeneous group. Data saturation depends on the research design and the characteristics of the participants (heterogeneous or subgroup interest). In a homogeneous group, research on 26 different interview studies showed that ‘84% of concepts emerged by the 10th interview, 92% emerged by the 15th interview, 97% emerged by the 20th interview, and 99% by the 25th interview’ (Turner-Bowker et al., 2018, p. 839).

Since this research interviewed a heterogeneous group who work within the same sector, the target was to conduct at least 30 interviews. Whilst Guest, Bunce and Johnson (2006) and Turner-Bowker et al. (2018) provided numerical guidance on the sample size of participants, Baker and Edwards (2012) and Hennink, Hutter and Bailey (2011), point out that although these numbers are contested, in practice, researchers are required to estimate the number of interviews before fieldwork. Hence, estimating the number of participants while maintaining flexibility during fieldwork is important. Following this guidance, this research aimed to interview at least 30 participants. Fortunately, the researcher was able to interview 33 participants. The following section details participant identification and recruitment.

3.3.1.1 Identifying and Recruiting Research Participants

Hennink, Hutter, and Bailey (2011) state that participant selection involves two stages: first, to identify a fitting group(s) of people for one’s research, and second, to identify the most effective strategies for recruiting them. They highlight that for qualitative data collection methods such as interviews, participants with specific qualities and experiences are recruited because they can “best inform” and answer the research questions (2011, p. 84). This is because interviewers are keen on obtaining detailed and contextual meaning of a phenomenon. To understand capital access in Kenya, this research aimed to interview investors, energy companies, research organisations, and industry associations. Table 5 below gives a summary of the research participants interviewed.

Table 5: Research Participants

#	Name	Occupation	Organisation Category	Interview Date
1	Alex	Researcher	Mini-grids Industry Association	23/06/2023
2	Alan	Investor	DFI	15/05/2023
3	Aiden	Investor	Multilateral Development Bank	12/05/2023
4	Arnold	Investor	Impact Investment Fund	11/05/2023
5	Boniface	Researcher	Research and Policy Institution	20/06/2023
6	Cate	Engineer	National Electricity Transmission Company	23/06/2023
7	Chad	Investor	Multilateral Development Bank	26/05/2023
8	Courtney	Researcher	Research and Policy Institution	16/05/2023
9	Cindy	Researcher	Research and Policy Institution	01/03/2023
10	Claire	Researcher	Research and Policy Institution	28/06/2023
11	Edward	Manager	Solar Company	24/02/2023
12	Eloise	Investor	Philanthropic Foundation	11/05/2023
13	Evans	Consultant	Consulting firm	28/06/2023
14	Garry	Investor	Private Equity	27/02/2023
15	Gia	Capital Markets Specialist	Development and Investment Agency	09/06/2023
16	Jackie	Investor	DFI	18/05/2023
17	Jack	Energy Developer	Solar Company	07/06/2023
18	Andrew	Investor	Venture Capital Firm	10/05/2023
19	Patricia	Investor	DFI	18/05/2023
20	Lea	Director	Mini-grids Industry Association	28/07/2023
21	Linda	Investor	Investment management, Advisory and Project Development	10/08/2023
22	Miles	Director	Investment Firm and Fintech Company	27/02/2023
23	Mark	Consultant	Consulting firm	06/06/2023
24	Paige	Researcher	Research and Policy Institution	01/06/2023
25	Reagan	Investor	Multilateral Development Bank	19/05/2023
26	Susan	Engineer	National Electricity Distribution Company	16/05/2023
27	Sadie	Researcher	Research and Policy Institution	13/05/2023
28	Shaun	Investor	Impact Investment Fund	08/03/2023
29	Sylvia	Manager	Off-Grid Energy Company	16/06/2023
30	Titus	Finance Officer	Investment management, Advisory and Project Development	16/06/2023
31	Walter	Investor	DFI	29/06/2023
32	Bernard	Researcher	Research and Policy Institution	30/06/2023
33	Zuri	Investor	Multilateral Development Bank	13/06/2023

The second step was selecting the best strategy to recruit these participants. The researcher used 3 of the five recruitment strategies proposed by Hennink, Hutter, and Bailey(2011): formal networks, informal networks and snowballing. Since the researcher worked in energy and climate change consulting before starting her PhD, she used these formal and informal networks to recruit participants. These networks were useful, as many identified participants from her network agreed to be interviewed for the research. Also, this meant that the researcher could reach the participants directly through her contacts, saving time. This also translated to a high response rate. Many of the contacted participants were willing to participate in the research. The researcher also used the snowballing strategy.

The researcher also requested the interviewees to introduce her to other professionals who could contribute to the study meaningfully. From this, some participants introduced the researcher to one or more participants, many of whom were willing and available for an interview. This was an effective strategy for recruiting participants and provided participants who, despite being mainly busy, were willing to do long interviews (60-90 minutes). To encourage participants to give time for a lengthy interview, the researcher utilized a meeting scheduling service, Calendly, which was beneficial in two ways: First, it allowed the participant to select the most suitable date for an interview, which reduced the back and forth that leads to participants losing interest in interview scheduling; second, it allowed the participants to change these meeting slots when faced with unavoidable circumstances. The researcher conducted the interviews virtually. Virtual interviews were effective because although many investors and energy companies invested in or operated in Kenya, many participants lived or travelled frequently to different parts of the world, and it would have been too costly for the researcher to travel for face-to-face interviews.

The researcher evaluated the selection and recruitment of participants to assess if it was appropriate, coherent, interpretive, and ethical and if it achieved saturation (Hennink, Hutter and Bailey, 2011). First, the researcher concluded that the process was appropriate and coherent because the selected participants had the characteristics and experiences to contribute to the research topic professionally, and the recruitment strategies were effective. Second, the process was inductive and constantly improved during the data collection

process based on the suggestions provided by the participants or from the researcher's reflection on the emerging points of discussion. Third, the interviews conducted achieved saturation. Fourth, the recruitment was ethical. The researcher received ethics approval from the University of Sheffield before starting the data collection. Also, the researcher gave participants an information sheet and a consent form. The participants were informed of their right to withdraw consent at any point during or after the interview. Against these principles, the researcher concluded that the recruitment of participants was fit for purpose, effective and ethical. The next section discusses how the researcher obtained quantitative datasets for this research.

3.3.2 Quantitative Investment Datasets

3.3.2.1 *Public Investment Data*

IRENA was the source of the public investment datasets used in this thesis. IRENA is an intergovernmental agency with many member states (169 countries and the European Union), including Kenya. One of its roles is providing data and analysis on energy transition investments. Several interviewees recommended the IRENA dataset to the researcher, highlighting it as one of the most detailed disaggregated data sources on energy investment. This was not the only recommendation. Other interviewees recommended the International Energy Agency (IEA) as an alternative data source. However, the free IEA investment data was not disaggregated at the country level and could not inform investments at that level. Therefore, that option was dropped, and the researcher settled on the IRENA dataset.

The IRENA dataset had several advantages. First, it has a historical archive of investment data since 2000. It provided data from 2000 to 2020, which can be analysed to understand public investments in the energy sector long before the 'private turn', providing a clear investment context. This is important because, as Newell and Phillips (2016) have pointed out, Kenya, like many other emerging markets, has relied on international public institutions to fund its energy infrastructure since the early 1960s.

The second and perhaps the most important advantage was its level of granularity. IRENA disaggregated the investment data into the following key data points: the name of the project;

name of the country (fund recipient); the region; the agency (funding institution); the donor country (the country that provides capital to the agency); the date of investment; the year of investment; energy category (renewable or non-renewable); the energy technology; the energy sub-technology (for example, on-grid or off-grid solar); finance group (debt, grants, equity, mezzanine finance, guarantees); finance type (this further disaggregates the finance group, for example, if debt, it categorises it as concessional or commercial); the amount of finance; and the source of the data. This data was provided in an Excel worksheet format.

With this level of data disaggregation, sourcing data from IRENA was not only detailed but also free. Given the researcher's limited budget, obtaining proprietary data would not have been possible. Using a secondary dataset saved the researcher's time (Hammond and Wellington, 2013). Collating 20 years of investment data from multiple organisations would not have been feasible for a PhD study, which is time and resource-bound. The researcher would have omitted some public institutions that co-invested in the same project, leading to a less accurate database. When reviewing investment analysis, a researcher must assess the accuracy to determine its reliability as a data source.

IRENA lists the Organisation for Economic Co-operation and Development (OECD) as the data source of most data points. The OECD has a data explorer where the IRENA data points can be compared. The researcher randomly selected different investment data points and checked if they matched those on the OECD Data Explorer. Most of the IRENA and OECD records matched, confirming the reliability of the investment data. Although this comparison outcome was not perfect, the researcher agreed with Hammond and Wellington (2013, p. 131), who have stated that triangulation underpins reliability and that there is no static 'state of reliability, only greater or lesser degrees'. Due to the data completeness, the researcher did not add new datasets. In addition to the public investment data, the researcher was keen to understand private investment in the energy sector in Kenya, which is discussed in the next section.

3.3.2.2 *Private Investment Data*

In alignment with the pragmatist approach, the next step in this research was to source private investment data to answer the first research question. The research question guided or dictated the researcher's direction and enabled the practical consideration of answering the question accurately (Biesta, 2012; Tashakkori and Teddlie, 1998). After deciding that the research needed a private investment dataset, the researcher also had to decide whether to obtain this from secondary sources or build one from scratch. Also, the researcher had to decide whether the dataset should cover multiple energy technologies or a single technology.

On first consideration, the researcher acknowledged that building a database from scratch would be incredibly difficult, time-consuming, and might lead to incomplete or less accurate data. To elucidate the researcher's concerns, it is important to remember the reasons behind the decision to introduce quantitative datasets in the first place. This was not to capture a small portion of the investment group in depth, but aimed at providing a broader context for the numbers to give a better understanding of interpreting the interviewees' narratives. Building this database from scratch would likely lead to data incompleteness and to being too niche to provide the broader context. Second, as Lima (2022) has pointed out, it is notoriously difficult to trace transnational investment. This difficulty is further exacerbated by how the investors fiercely guard their confidential investment deals. Lima (2022) has emphasised that, although this is a shared struggle in core and periphery countries, it is even harder in subordinate countries – meaning emerging markets – to access this data. With this knowledge, the researcher decided that using a secondary dataset for private investment would be more appropriate and feasible. The researcher's next question was whether to focus on private investments for multiple technologies or one, and, if so, how to select this.

Early in the researcher's process of attempting to find a solution to this question, the researcher encountered the opaqueness of the investment world, or as Lima (2022, p. 46) has called it, 'the black box'. Due to the strict confidentiality of deals, it is hard to find collated investment data across different technologies, and when it exists, it is not free. Considering this difficulty, the researcher decided to focus on one technology. Admittedly, the researcher had three advantages or guides in technology selection. First, an extensive literature review, including an analysis of policy and industry documents, demonstrated that the highest

private investments in the energy sector were directed towards solar, specifically, off-grid solar (CPI, 2024; Climate Policy Initiative, 2022; The National Treasury, Climate Policy Initiative and The Kenya Climate Innovation Centre, 2021; Falduto, Noels and Jachnik, 2024). Second, early access to the free and publicly available IRENA dataset. The preliminary analysis of this data showed that solar technology was among the significant capital recipients. Finally, the researcher's professional knowledge and experience were helpful in this decision. The researcher knew of the solar industry association, GOGLA, which brings together private investors and solar energy companies globally. Having read GOGLA's annual reports, which provided insights for its members and the public on growth and investments within the industry, the researcher reached out to request private investment data.

Reaching out to GOGLA was purely out of bravery and hope. First, the researcher had no personal relationships or linkages with anyone working there. Second, since GOGLA did not share its data publicly, the researcher was unaware whether the association had a data-sharing policy for academic pursuits. Despite this uncertainty, the researcher considered it a worthwhile attempt. Fortunately, after several meetings discussing the researcher's data needs, purposes and sharing policies, GOGLA agreed to provide the private investment data. This was tremendous progress in data collection because the researcher received rich, detailed data that included the following data points: year of investment, investor, fund recipient (energy company), finance type (debt, grants or equity), geographical focus (regions), company stage, and the amount of investment. The data provided spanned from 2012 to 2022 investment period. The disaggregated data provided was collated from public data sources, or the investors had informed GOGLA that the investment deal was public.

Though detailed, the private investment data received did not disaggregate the investment data by country but rather by region. This aggregation is because many investment firms and energy companies operate in multiple countries. However, this was a relevant data point needed to enable the researcher to analyse investment at the country level (Kenya) while also having a regional context. Hence, the researcher expanded this dataset by an internet search of all the energy companies – on their websites or media releases – detailing their country(ies)

of operation and business model. The expanded database added the additional datasets in Excel columns to match the original data. This addition was important in understanding the amount of capital flow to Kenya and its neighbouring countries, Uganda and Tanzania. The receipt of the private investment data and its expansion were relevant in answering key research questions for this thesis. The other key data source that was important in providing an in-depth understanding of investment practices was documents.

3.3.3 Documents

Documents are used in this research to complement interview data and investment datasets. Although captured in different mediums, documents are written records of a phenomenon produced by people within a specific context. However, Matthews and Ross (2010) expanded this definition to include information stored in film, video, or audio mediums. Documents can be the primary data source for research or complementary to others (Hammond and Wellington, 2013). In this research, documents complemented other data sources. Documents provided a large amount of contextual information to understand historical and present capital access challenges in Kenya's energy sector. These documents included national policy documents, national census reports, industry reports, news articles, investment reports, blogs and company policy documents. Most of the documents collected were publicly available information accessed through the internet. In addition, the researcher also obtained confidential documents from some participants willing to provide additional information to help the researcher understand some of the emerging discussions at the analysis stage. Documents collected provided both a static 'historical' and 'present' snapshot of capital access in Kenya. This is imperative because struggles for capital access in Kenya are not new. Therefore, it was important to look at the past and present struggles or, at the very least, the author's perceptions of those struggles.

This section detailed the data collection methods for this thesis. The next section briefly discusses the data analysis.

3.4 Data Analysis

Data analysis included inductive thematic analysis for the qualitative datasets and deductive descriptive statistics for the quantitative datasets. As described in section 3.1.2, because the research evolved from a qualitative to a mixed-methods approach, the first dataset collected was qualitative. A key part of this evolution was the researcher's reflection on the study during data collection and documentation using analytical memos. (Matthews and Ross (2010) highlight that a researcher constantly thinks about the collected data and advises that they record their ideas and reflections during the data collection and analysis stage. In this thesis, analytical memos guided the evolution and analysis of the research. Before describing the qualitative and quantitative data analysis, the following sub-section summarises how analytical memos were used in this thesis.

3.4.1 Analytical Memos as an Instrument of Research Evolution and Data Analysis

Memos are a researcher's uninhibited record of thoughts, insights, feelings, and ideas about the study. Goulding (2002) and Birks and Mills (2015) state that analytical memos are useful for the following reasons: conduct a preliminary investigation of the data to develop concepts; identify data or analytical thinking deficiencies at an early stage; help re-orient a researcher to earlier thinking during the complex stages; identify embryonic ideas to develop further and; keep an audit trail of records and evolution during the data collection and analysis stage.

This research used analytical memos to reflect on the process, identify potential problems or concerns, and examine the researcher's philosophical position (Birks and Mills, 2015). Ultimately, the philosophical underpinning of the research moved from a transcendental phenomenology approach to a pragmatism paradigm, which mainly focuses on the guidance of the research questions to determine the methodological choices. Early in the process, whilst trying to do a preliminary analysis, the researcher discovered deficiencies in the study. Whilst making preliminary theme developments and categorisation, it was evident that comparing (similar and contrasting) views was going to either lead to misrepresenting the participants' views or an erroneous interpretation due to the heterogeneous characteristics of the participants. Hence, from the reflections, the researcher decided to adopt a mixed methods approach, introducing quantitative investment datasets of the public and private

investments not only to gain context and breadth of investments in the energy sector in Kenya but also to understand the unique context between these two groups. Memos were also used during the data collection stage to reflect on the data collection process or interviews and highlight issues/responses that may require future clarification or to be included in the upcoming interviews or document reviews. As a result, the initial interpretation of data assisted in mapping out emerging themes, concepts, or ideas noted during the data collection process, which were further explored during subsequent interviews or data analysis stages. After the dynamic and flexible data collection process concluded, the next stage was the concurrent data analysis of the quantitative and qualitative datasets.

3.4.2 Thematic analysis

The researcher carried out a thematic analysis of interview data, documents, and memos to identify key consistent or contrasting ideas. Matthews and Ross (2010) state that thematic analysis includes “segmentation, categorisation, and relinking” of data to identify themes, patterns and relationships before making conclusive interpretations. This definition highlights a key characteristic of inductive data analysis: its iterative and cyclic nature. In general, interview data analysis is an ongoing process of data engagement that commences with reading of the data, data reduction to meaning units, review of the meaning units, then performing thematic clustering, data comparison, writing descriptions and reflections until the essence of the participant’s lived experience is fully captured (Neubauer, Witkop and Varpio, 2019).

The researcher used NVivo, a data analysis software, to transcribe and analyse the datasets. After transcription, the researcher cleaned the transcripts in preparation for data analysis. NVivo provided a platform for systematic data analysis. Due to the heterogeneity of the participants, the researcher set ‘cases’ for all the interviewees and the interviewer. Cases enable each participant to be a single unit of analysis. This was important for two reasons. First, it allowed the researcher to add and link additional material to a single unit of analysis. Second, it enables the researcher to build a case or ‘unit of analysis’ classification with

demographic details that are important in interpreting and understanding the data. For example, the researcher can investigate how different groups talked about or contributed to a specific theme and why the differences exist within or outside certain groups. This was important for a reliable and nuanced interpretation of the data. Figure 2 below shows those classifications.

Case Classifications			
⊕ Name	▲ Created on	Created by	
☐ Demographics	02/10/2023 11:50	WMM	
⊕ Name	Type	Created on	
☐ Occupation	Text	02/10/2023 12:29	
☐ Type of Organization	Text	02/10/2023 13:08	
☐ Stakeholder Type	Text	10/10/2023 14:40	
☐ Technology	Text	07/10/2023 14:24	
☐ Energy Industry Segment	Text	07/10/2023 15:08	
☐ Secondary Industry Segment	Text	03/02/2024 16:29	
☐ Type of Investment	Text	07/10/2023 14:53	
☐ Primary Financial Instruments	Text	07/10/2023 15:23	
☐ Secondary Financial Instruments	Text	23/10/2023 11:08	
☐ Target Investees	Text	23/10/2023 11:16	

Figure 2: Research Participants' Case Classification

During the thematic analysis of the data, the researcher investigated the meaning of the collected data, identified and categorised initial themes, and later recategorised them to look for relationships. Although the researcher had broader ideas on key elements of the data, new and emerging themes were pursued and developed. Thematic analysis for qualitative datasets helped reveal capital access challenges from the participants' perspective. In addition to the thematic analysis, the researcher conducted a descriptive statistical analysis of the investment data.

3.4.3 Descriptive statistical analysis

The analysed public and private investment data provided the breadth and context of capital access gaps, challenges and needs. Yang (2010) states that (descriptive) statistics are effective in the following five ways: determining the existence of a phenomenon, identifying patterns

and trends from large datasets, comparing results across different groups, understanding unique effects of factors and evaluating the impact of interventions such as policies and actions. The researcher analysed the public and private investment datasets in an Excel worksheet to determine the extent of capital access challenges and highlight those who struggle to access capital. It also provided a temporal understanding of capital access trends in Kenya, which, together with document analysis, helped understand the effect of interventions in Kenya. It also allowed for comparison among different actors following the identified investment patterns. Overall, the quantitative analysis of these datasets complemented the understanding of the thematic analysis of the qualitative datasets.

3.5 Positionality

Positionality, keenly considered in this research, was a key part of the researcher's reflection. First, as a Kenyan citizen born and raised in the village, the struggle for energy access is not just an academic curiosity but a lived experience. The researcher has also worked as a consultant to large international organisations. Previously, in a consultancy capacity, she worked as a fund administrator for a technical assistance facility (TAF) that offered grants to energy companies for business activities investors were averse to funding. As such, positionality is considered at two levels: the researcher's position against the study and the research interview participants.

A researcher's reflection on positionality enables them to investigate their professional background and beliefs (Hennink, Hutter and Bailey, 2011). It is important to note that achieving an absolute dissociation from the research is unattainable as researchers cannot rid themselves of their world's outlook, past professional experiences, and academic knowledge, which are valuable guides to a determination of a worthy social inquiry (research) and ease of appreciation for specific topics (Neubauer et al., 2019; Hammond and Wellington, 2013). Hammond and Wellington (2013, p. 118) further write that positionality is highly contested when there is an 'asymmetry between the researcher and the researched'. In this thesis, the researcher has a marginal yet noteworthy asymmetry. While her academic background is not in finance, she has level 4 training in public accountancy in Kenya, which enables her to

understand financial reporting. Second, and perhaps the more important point, she has professional experience working with an investment firm and energy companies looking for finance. Seeing the struggle of capital access first-hand inclines her to believe this is a real problem worthy of inquiry.

The second reflection on positionality is the power dynamic between the researcher and the participants. Hennink, Hutter and Bailey (2011) state that an interviewer's presentation of their title or role influences the power dynamic in an interview. Undoubtedly, this research's participants were mainly more powerful than the researcher. However, due to previous professional interaction, the researcher did not experience emotions of extreme self-awareness beyond those that naturally would occur in most people conducting an important interview. Wengraf (2001) argues that, hopefully, the interaction between an interviewer and the interviewee would be a friendly conversation without a keen focus on emotion and power dynamics despite their positionalities. The researcher found the conversations friendly and comfortable to ask and challenge the discussion points. Despite the participants' generosity and friendliness, the researcher was keen to respect their time, prepare diligently for the interviews, and engage in additional discussion that would otherwise not be available from public sources such as their website. However, this was not beyond what she would otherwise do professionally, regardless of a participant's social status.

This chapter outlined the methodological selection and evolution for this thesis. It details the data collection methods, data analysis, and the researcher's positionality. The following chapter is the first empirical chapter focusing on public energy investments in Kenya.

Chapter 4: Historical Public Investment Trends for the Energy Sector in Kenya

4.1 Introduction

This chapter is the first of the four empirical chapters in this thesis, and it is the first of two chapters that analyse public and private investment trends to answer the first research question: Who are the influential actors enabling capital access in the energy sector in Kenya, and how do they invest? This chapter focuses on public investments informed by the IRENA dataset, interviews and document analysis. The IRENA dataset provides a long-term historical perspective of a 20-year investment period, and it is a repository of data that provides a window into investments both pre- and post-energy transition mainstreaming.

This chapter is organised into four key subsections: 1) a retrospective two-decade investment trend analysis of international public investors and the role of policy in capital access; 2) the contribution and commitment of influential public investors; 3) the nature of investments, highlighting the type of capital provided, its evolution and implications; and 4) investment analysis by technology. The research finds that geothermal technology receives substantial public investments relative to other technologies. Therefore, this study explores this sector to reveal niche capital access needs and challenges.

Cumulatively, this chapter highlights Kenya's progress in capital-raising from the early 2000s, the role of policy reforms, and the influence of public investors. This progress is categorised into '*capital paucity*' and '*capital growth*' stages, with the former highlighting a decade of struggle and the latter a consistent and significant increase in capital access. Notably, Kenya managed to maintain investors from the former stage, and an influx of new investors entered its energy market in the latter stage. However, this progress has been derailed by both broad and niche challenges. Kenya's energy market is heavily financed by debt and, alarmingly, the rapid absorption of commercial-rate debt. High-cost debt is coupled with other factors, such as volatile foreign exchange (FX) risks. Hence, there is a dire need for more financing, especially local financing. Domestic public funding support from

the government to access cheap capital is threatened by the government's borrowing ceiling, which Kenya has exceeded. This situation could lead to an increased reliance on IPPs and increased pass-through costs charged to Kenyan citizens, making electricity more expensive.

4.2 The Evolution and Growth of Kenya's Capital Access from Public Investors

This section presents the findings of the IRENA dataset for a period spanning two decades of public investment trends. First, the section describes capital sources termed as '*public*' specific to this dataset to provide definitional context. Second, the section outlines the quantity of investment over those two decades and its split between renewable and non-renewable energy sources.

As recorded in the IRENA dataset, public investments come from the following sources:⁸ governments, state-owned financial institutions (SOFIs), state-owned enterprises (SOEs), national DFIs, multilateral DFIs and bilateral DFIs.⁹ These investments are considered public primarily because their funds come from donor countries; however, their recipients need not be. Though sourced from public sources, their investees may be state-owned utility companies, private companies, private or PPP-structured IPPs. The IRENA dataset exemplifies this diversity, since it contains investments in private companies (such as d.light design Inc.), state-owned utilities (such as KenGen), and IPPs (such as OrPower 4 Inc.).

Although not perfect, Kenya is among the few attractive markets for investors in SSA. An investment officer, Zuri, highlighted that Kenya is an attractive market that appeals to investors and experienced developers in the energy market.

"I think Kenya is a very mature market. It's mature both in terms of the ability of financiers to identify projects, but also maturing in its ability to attract developers. So, if you look at the profile and the

⁸ <https://www.irena.org/Publications/2023/Feb/Global-landscape-of-renewable-energy-finance-2023>

⁹ Examples: bilateral DFIs, e.g., the German Development Bank (KfW); national DFIs, e.g., China Development Bank; SOEs, a legal entity created by a government to partake in commercial activities on the government's behalf, e.g., ESKOM; multilateral DFIs, e.g., an international finance corporation (IFC); state-owned financial institutions e.g., UK Green Investment Bank plc (sold to Macquarie in 2017).

nature of developers in Kenya, I think they're very mature, and most of them are international and highly experienced, and they still find this an attractive market. So, I think it's an attractive and neutral market. It is not without its challenges, but I think it's a good market."

(Zuri, IFC, Investment Officer)

The quantitative analysis confirms this point. Kenya is among the countries that received the highest investment in Africa, most of which was invested in renewable energy (RE) sources. Kenya received ~US\$4.832 billion of investments from international public sources between 2000 and 2020, ranking seventh in Africa, three rankings lower than its average GDP over the same period in SSA.¹⁰ Nonetheless, this ranking highlights Kenya's favourability in the SSA market.

Strikingly, the results also indicate that most of those investments largely financed RE sources. In Kenya, RE investments were dominant, with the split being 93.68% (US\$4527.02 million) for RE sources and 6.32% (US\$305.19 million) for non-RE sources. This is above the average in Africa. On average, 59.01% of public investment in Africa was in RE sources, and 40.99% was in non-renewable sources. Figure 3, below, illustrates the 20-year investment trend between renewable and non-renewable sources. Further in-depth analysis highlights that not only is non-renewable investment significantly less, but so is its frequency.

¹⁰ World Bank development indicators: [World Development Indicators](#) | [DataBank](#)

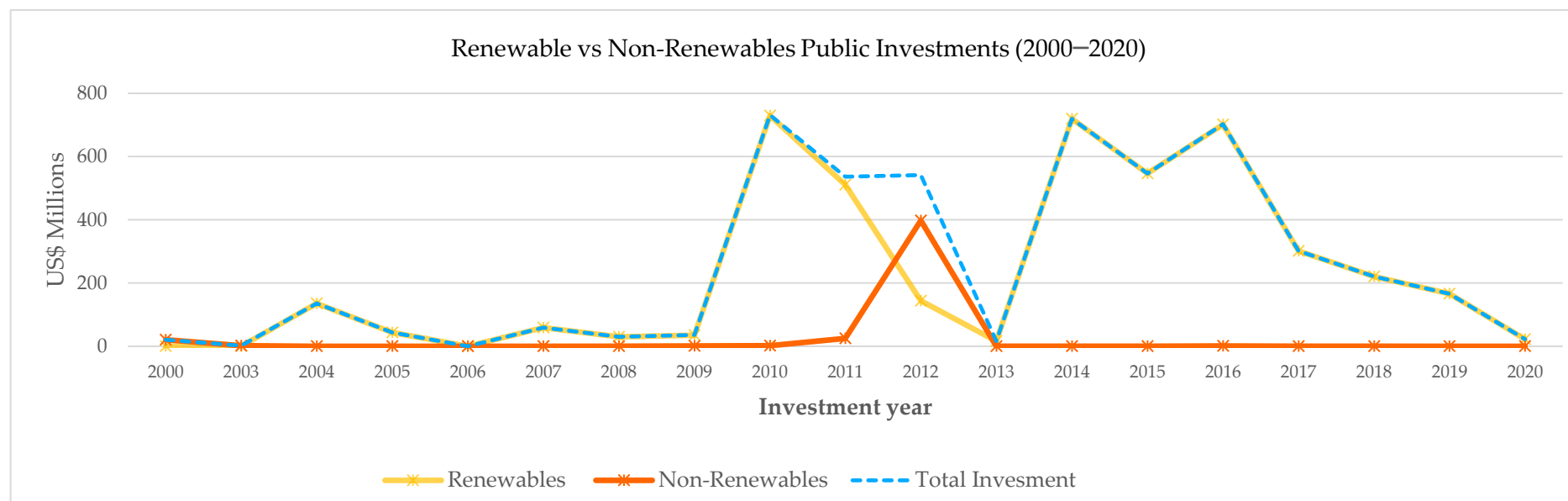


Figure 3: Renewable vs. Non-Renewable Public Investments between 2000 and 2020

The number of investment deals for non-renewables is few. Marginally, over half (51.38%) of the US\$305.19 million invested in non-renewable sources was a single European Investment Bank (EIB) project to construct three thermal power generation projects and one geothermal plant in 2012. In addition, only 7.94% of the documented deals were categorised as investments in non-RE sources. Hence, it is unsurprising that Kenya's energy sector has been, and remains, mainly powered by RE sources. Although financing was channelled to RE sources, such investments were neither consistent nor equally distributed across the 20 years.

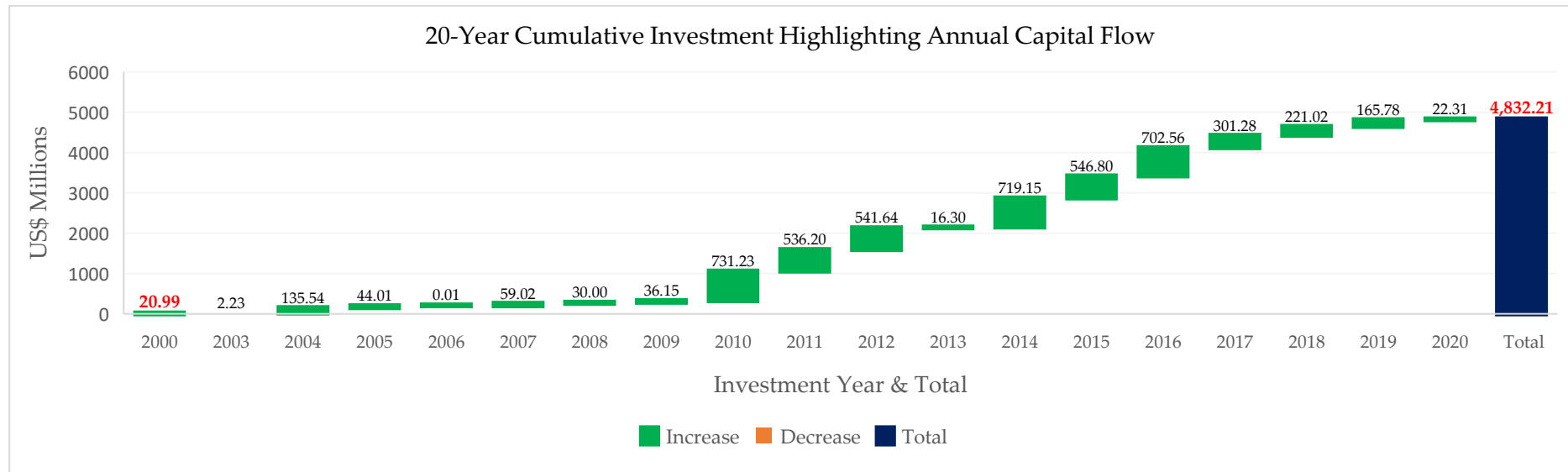


Figure 4: 20-Year Cumulative Investment

In the earlier years in Figure 4 above, it is evident Kenya struggled to raise public investments for its energy sector. The graph's first half (2000–2009) reveals a plateaued trend for a decade, with the sector receiving US\$327.94 million. Strikingly, in that period, the country failed to attract any investments in 2001 and 2002. 2010 was a significant year, with its investment (US\$731.23 million) being ~2.2 times that of the previous 10 years. 2010 stands out as an inflection point: the start of an era of significant capital access growth. Public investors invested 91.25% of ~US\$4.832 billion between 2010 and 2020.

To understand this inflection point – the start of the capital growth stage – this research argues that 2010 was a tipping point that benefitted from the long legal and regulatory foundation laid in 1997. Hence, it was not the year in and of itself that extraordinarily turned the wave of capital-raising struggle but the preparatory work during the capital-raising struggle period. One interviewee echoed this view: *“Kenya is leading in terms of the flow of capital into the energy sector. Now, why is that so? I think Kenya has done more in terms of putting policies and strategies in place to attract or build investors’ confidence.”*

(Bernard, Research Organisation, Africa Lead on Energy Access)

To explore this point in greater depth, let us turn briefly to the regulatory foundation of the energy sector.

The energy sector benefitted from a series of legal reforms that restructured the national utilities operation but, most importantly, paved the way for private sector participation. Prior to the 2010s, Kenya had established the Electric Power Act No. 11 of 1997, Sessional Paper No. 4 of 2004, and the Energy Act No. 12 of 2006 (Mwawughanga, 2005). The Electric Power Act No. 11 of 1997 was the principal regulatory framework that established and mandated the Electricity Regulatory Board (ERB) with the issuance of licences for generating, transmitting, and distributing electricity; overseeing transmission and distribution tariffs; and assessing and approving power purchase agreements (PPAs). The Act was the pioneer legal framework to enable private sector participation in power generation.

Sessional Paper No. 4 of 2004 recommended policy changes to be enacted in an Energy Act that would succeed the outdated Electric Power Act No.11 of 1997, citing a need to bolster investor confidence. Moreover, the paper recommended further restructuring and unbundling the power sector, separating electricity transmission and distribution. The former was to be carried out by a 100% state-owned company, and the latter was to be privately owned, albeit partially. The paper also suggested the following: establishing the Geothermal Development Company (GDC) to explore geothermal resources and the sale of steam to IPPs, as well as transforming the ERB (established under the Electric Power Act No. 11 of 1997) into the Energy Regulatory Commission (ERC), with sufficient legal mandate to oversee the entire energy sector. These and many other recommendations were adopted and enacted in the Energy Act No. 12 of 2006. One distinctly obvious aspect is that Kenya

struggled to raise finance for its energy sector during this period. Sessional Paper No. 4 articulated that, after the Cold War, the large sums of development assistance Kenya relied upon from external sources had significantly dwindled. Although this lack was mainly because the development partners insisted on private sector participation, the paper stated that the market liberalisation in 1997 had not attracted significant private sector interest, and there were delays in IPP negotiations, hence the recommendations and the enactment of Energy Act No. 12 of 2006 ((Ministry of Energy, 2004). Given this struggle, Kenya continued legal and regulatory reform.

Due to the prevailing challenges and the need to resolve existing delays with IPPs and attract more rapid investments, Kenya increased its regulatory and legal support for the sector. The country developed comprehensive strategy plans, updated the energy laws, and made the sector a key priority (and an enabler) in its climate change mainstreaming documents. Examples include the following: feed-in tariffs for RE 2012, the Energy Regulations 2012 (electricity licensing, solar photovoltaic systems, energy management and solar water heating), Kenya Investment Prospectus 2016, KNES 2018, and the Energy Act 2019, among many NDCs, mitigation and adaptation action plans. This research found that the country maintained a vibrant legal and regulatory momentum until 2010 and beyond in its pursuit of attracting investment from external sources.

The World Bank highlighted that international investors/donors in the 1990s emphasised four key sector reforms: restructuring the power sector, the establishment of an independent regulator, private sector participation and competitiveness in the energy market. These points are further demonstrated by the World Bank's report by Godinho and Eberhard (2019), which highlights that Kenya scored well in the power sector reform index, which assessed reform of the four areas demanded by international investors (2019). From 2006, Kenya scored ~85% on the power sector reform index, yet not until 2010 did this reform translate into successful capital flows. Reflecting upon Kenya's regulatory framework and pathway, it is apparent the energy sector worked to ensure they fulfil these requirements, which highlights the influence of (international) investors in shaping the energy markets.

Kenya's energy sector has an embedded reliance on international finance. Although Kenya's energy sector evolved from a predominantly state-led and hydropower-dominated regime to a partially liberalised one, its financing has remained the same: "Prior to liberalisation, an energy regime [...] had been created through large state-capital infrastructure projects, built by foreign investors and subsidised by the state..." (Newell and Phillips, 2016, p. 42). Examples include the World Bank's financing of power projects in the 1970s, the geothermal development and energy pre-investment project in the 1980s, and the energy sector reform and power development project in the 1990s. The latter is vital because it was a US\$798.90 million project with six objectives, chief among which was sector restructuring, reform and enabling utilities to operate commercially and sustainably. Kenya implemented this vision by creating legal and regulatory frameworks for private sector participation in energy generation. To highlight the critical role and influence of public international investors, the Ministry of Finance (MOF) wrote a letter outlining the power sector policy that detailed the energy reform agreement between the IMF and the World Bank, which made the latter's investment conditional on this reform. In other words, Kenya needed the money and would not get it unless it reformed its sector. This was among the pioneer projects in SSA designed to enable and facilitate a move towards a more liberalised energy market. In Kenya, this move was actualised through the Electric Power Act No. 11 of 1997, highlighting the pioneering steps in using legal, regulatory and market liberalisation to pave the way for private capital in Kenya.

However, to understand why 2010 was an inflection point, this research argues that although there is a strong correlation between legal and regulatory reforms and investment growth, there is always a lag between reform and investment. Investments are not made instantaneously; there is always a lag between the announcement/enactment of policies and their implementation. This lag is exacerbated by a delayed stakeholder behavioural adaptation period to migrate from the status quo to the new norms of doing things (Godinho and Eberhard, 2019). Furthermore, given the risk-averse nature of most investors, confidence cannot be built instantaneously by legal reform; it comes from an established track record of operationalising such policies and engagement with the investors: for example, the delayed PPA implementation of Strathmore Research and Consultancy Centre (SRCC) to earn

revenue from selling power to KPLC (David, 2017). However, eventually, Kenya rose out of its slump, raised more investment and, most importantly, built investor confidence, which seemed to snowball and continue to grow, with one investor stating the following:

“The ease of access to finance from IFC earlier, such as 10 years ago, was difficult because there weren’t many businesses that were investment-ready for amounts more than US\$20 million; however, the business has evolved, and the IFC now can even engage developers from day one, not to write a check or provide financing but can also offer advisory services, such as ESG [environmental, social, and governance] and environmental standards.”

(Zuri, IFC, Investment Officer)

Figure 5 below captures the chronology of Kenya’s evolution in capital raising stages discussed in this section.

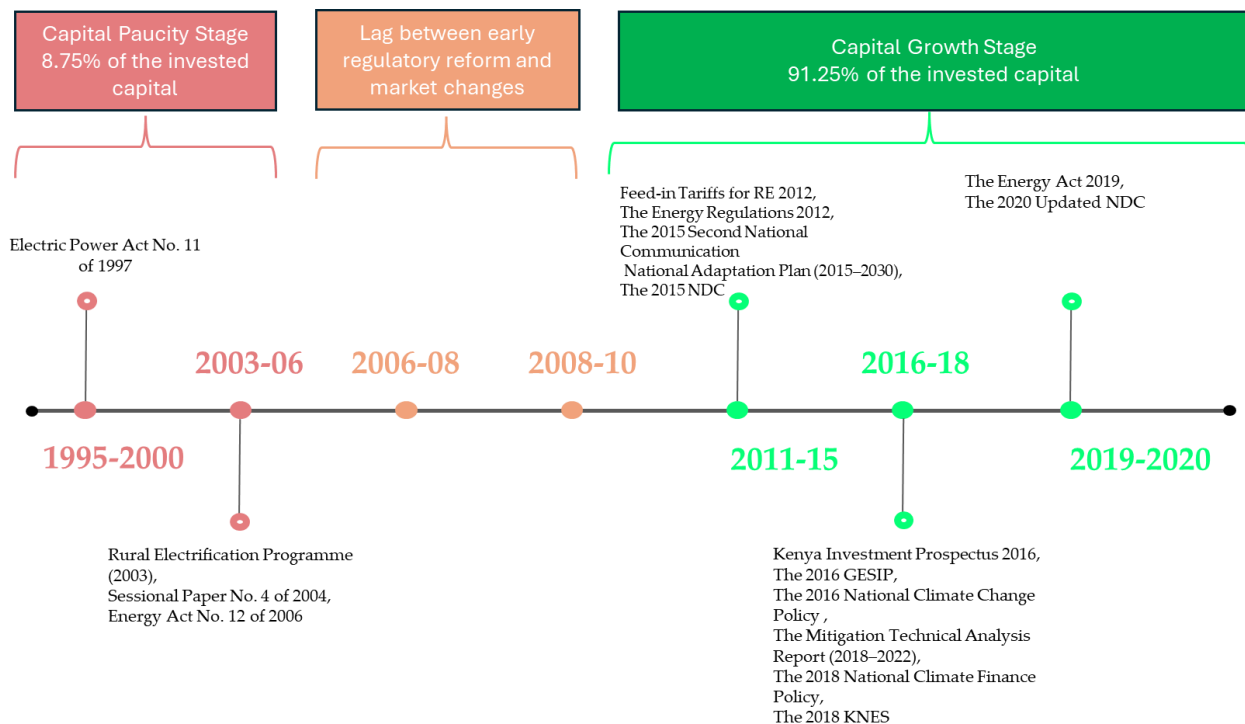


Figure 5: The Relationships Between the Evolution of Kenya’s Capital Raising Stages and Regulatory Reforms

The discussion now turns to the IRENA database to discover which investors have contributed significantly to Kenya’s energy sector and how they invested.

4.3 The Contribution and Commitment of Influential Public Investors

This section outlines and explains the energy sector's most influential and significant investors in Kenya based on the quantity of their investment and how they invested. The section further illustrates the country's capital growth post-2010s by analysing the investors' spread and frequency of investments across the two decades to understand how these investments were made and their distribution in projects. Finally, the section highlights the evolution of the energy market in attracting new investors while retaining some early investors.

Having laid the legal and regulatory groundwork in the energy sector from the mid-1990s to 2006, Kenya inspired investor confidence. In the years that followed, Kenya attracted more international investors to provide capital to various energy companies and projects. Specifically, the IRENA dataset recorded that more than 50 public international investors financed the sector between 2000 and 2020. A small number of investors (10) provided the majority of the capital (about 90%): altogether, investing a total of ~US\$4.3 billion in Kenya's energy sector. Table 6 below breaks down their investments in Kenya's energy sector.

Table 6: Top 10 International Public Investors and the Amount of Capital Invested

#	Name of the Investor	Amount Invested (US\$ Million)
1	US International Development Finance Corporation (DFC)	979.89
2	Japanese International Cooperation Agency (JICA)	803.73
3	Ex-Im Bank of China	657.52
4	International Development Association (IDA)	498.99
5	European Investment Bank (EIB)	316.61
6	French Development Agency (AFD)	288.33
7	International Finance Corporation (IFC)	268.89
8	Kreditanstalt für Wiederaufbau (KfW)	223.68
9	Japan Bank for International Cooperation (JBIC)	143.01
10	African Development Fund (AfDF)	115.74

Although the findings reveal that, cumulatively, the top 10 public investors invested large quantities of capital, they do not indicate how this capital was invested. Nevertheless, the results do illustrate whether investors provided large capital investments to a few projects or multiple investments to many companies. Furthermore, are the high investments as a

result of investors having a long presence in Kenya's energy sector? Were these investments made pre-2010s or post-2010s? In those two periods, did Kenya have the same investors, or did they change? Equally significant, what type of capital did they provide, and was this consistent in those two eras? To answer these questions and understand public investors in Kenya, this research begins by considering the spread and frequency of individual investments across the two-decade period.

To understand the spread and frequency of investments, the research begins by categorising investors into three groups based on the investment amount. These groups are the top-10 investors (listed earlier – 89.66%), the top-20 investors (ranking 11–20: 7.88%) and the others (remaining 35 investors: 2.46%). Figure 6, below, illustrates the spread and frequency of investments across those three groups. The spread highlights the distribution of investors and their deals between 2000 and 2020, and the frequency reveals the number of investments made by each group. This figure helps answer how the investments were made. These groups were created based on the quantity of investments provided. Since 10 investors provided ~90% of the capital invested, these investors influenced and shaped the characteristics of the investment landscape, as discussed earlier, regarding their role in regulatory reforms. In a sense, these investors are the “movers and shakers” of international public investments in the energy market.

Investors across the three groups invested in Kenya's energy market in both eras (pre-2010s and post-2010s), albeit the frequency of investments increased greatly in the latter. The results reveal the top-10 investors made twice as many investment deals as those in the other two groups. In two decades, the top 10 group had an average of 9.1 deals per investor compared with 4.3 and 4.0 for the top 20 and others, respectively. This is a key finding because it indicates the top 10 investors not only invested large sums of capital, but these investments were made in several projects. The multiplicity of investment deals indicates a regular capital flow, which signals a frequent engagement of stakeholders within the sector. This finding reveals that, in the two decades of investments by public investors, both large and small investors were present in the energy market, even though the major investors made investment deals twice as often as the small investors. However, as highlighted by both Figure 4 and Figure 6, the two investment eras differed. The next section explores this issue in greater depth to understand this difference.

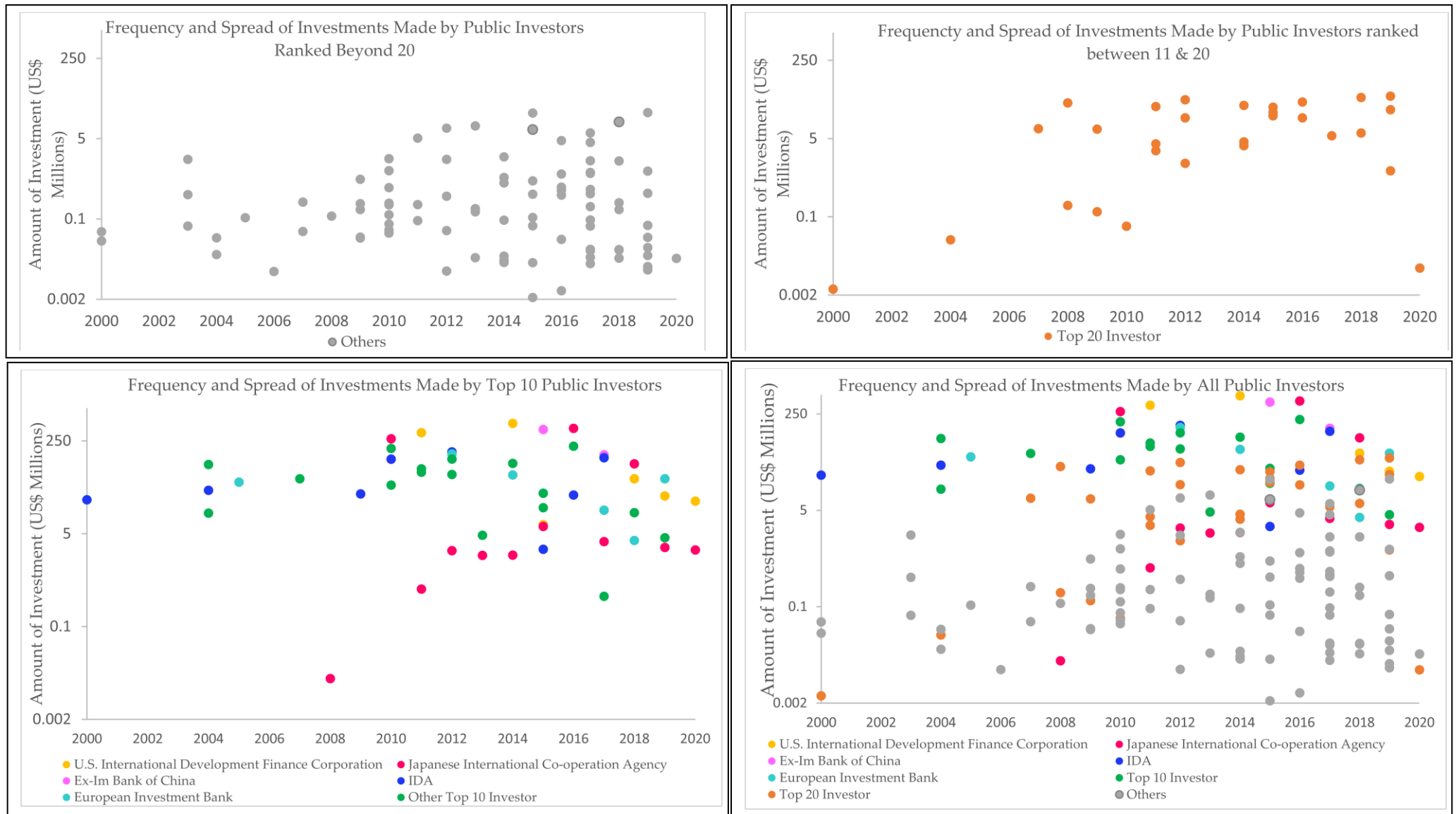


Figure 6: Frequency and Spread of Investments by Public International Investors 2000–2020

There is a clear distinction between the two investment eras based on the quantity, frequency and distribution of investment deals illustrated in Figure 4 and Figure 6. To articulate these two periods clearly, this research refers to the pre-2010s as “*capital paucity*” and the post-2010s as “*capital growth*” stages. A cursory look at Figure 6 reveals a dense distribution of investment deals across the three investor groups in the capital growth stage. The results indicate that only 39 investment deals were made in the capital paucity stage, which jumped by 505% to 236 in the capital growth stage. This increase in investment deals massively increased the amount of capital invested by 1274%, from US\$327.94 million during the capital paucity stage to US\$4,504.28 million in the capital growth stage. Although one investor can make multiple investment deals, the research considers whether these were made by a small number of investors who were there from the start or whether this changed.

The capital growth era retained most of the early investors while welcoming an influx of new investors. Similar to the increase in investment deals, there was a tremendous jump in the number of investors. In the capital paucity stage, only 18 investors invested in the energy market, increasing by 194% to 53 investors in the capital growth stage. Sixteen of the 18 early investors made subsequent investments in the capital growth stage. Five of the top-10 investors were early investors, and four of these continued making investments in the capital growth stage. In this group, although they collectively made 91 investment deals, the ratio of those made in the capital paucity stage to the capital growth stage was 1:9. The 811% increase is attributable to a rise in the number of investors but, most important, due to the multiple investment deals made in the latter stage. For example, JICA stands out for making one investment in the capital paucity stage and 27 in the capital growth stage. This change is consistent across the other groups, since there were either few investors in the paucity stage, but this increased in the growth stage, or the early investors made more investment deals in the latter stage. Having discussed the presence and growth of investors in the two investment periods, the next section focuses on the nature of the capital investments made in those two eras, whether this influenced the type of projects invested in, and whether any distinction exists regarding those parameters across the investor groups.

4.4 Nature of Investments: Financial Instruments

This section discusses the type of capital provided or financial instruments used to invest. The discussion considers how these financial instruments changed or remained the same across the two capital-raising stages and examines this point across the three groups to determine whether investors had capital provision preferences. Finally, this section ties this conversation to the nature of the projects funded.

The majority of the capital invested in Kenya's energy market by public international investors was made through debt capital, although most of it was concessional. Table 7, below, is a summary breakdown of the financial instruments used for investments, and 87.74% of the capital invested was debt. This result clearly distinguishes between concessional and standard debt, with the former constituting 48.67% and the latter 39.07% of the total capital invested. Therefore, most of the debt was provided at a cost below the market rate. These favourable terms are often given to catalyse investments from the private sector to address market barriers or financial gaps. The rest of the debt was provided at the prevailing market rate. In addition to the dominance of debt capital, other types of capital were provided.

Table 7: Finance Group and Type of Financial Instruments Provided to the Energy Sector in Kenya

Finance Group	Type of Finance	Amount (\$millions)	%	Sum %
Debt	Concessional loan	2351.72	48.67%	87.74%
	Standard loan	1888.05	39.07%	
Equity	Common equity	104.66	2.17%	2.17%
Guarantees & Others	Guarantees/insurance	326.20	6.75%	6.75%
Grants	Standard grant	151.76	3.14%	3.31%
	Interest subsidy	8.22	0.17%	
Mezzanine Finance	Subordinated loan	1.40	0.03%	0.03%
	Other hybrid instruments	0.20	0.00%	

Although eclipsed by the debt, several financial instruments were used to provide capital to the energy market, including equity, guarantees, grants, interest subsidies and other hybrid instruments that comprised the meagre portion of the capital provided. Equity financing and other hybrid financing instruments were even rarer than the guarantees and grants from

public international investors. In Table 7, guarantees are a distant second after debt. Guarantees constituted about 6.75% of the total capital invested in the two investment eras – a notable investment of US\$326.20 million. Guarantees are insurance-like financial instruments used as risk mitigation tools for projects or investments. Often, they enhance credit provision certainty by providing certainty to a lender that all or part of their capital will be recovered in case of a loss or default. They also may include other risks, such as political risks.

The lack of guarantees and grants is an apparent impediment to unlocking more private sector capital and may be vital for attracting more local financial institutions. The investment risks in emerging markets mean guarantees can be useful for unlocking and accelerating capital access. However, Table 7 indicates guarantees were as rare as other catalytic instruments, such as grants. One interviewee, a local development researcher and practitioner, Benard, bemoaned the high levels of debt provision and scarce guarantees and grants: *"It's becoming a bit problematic for us to continue speaking about these investors because of the debt conversation...none of [these are] grants. None of it is even guarantees."*

(Bernard, Research Organisation, Africa Lead Energy Access)

The interviewee highlighted that although capital provision is vital, ensuring a sustainable model is equally important, if not more so. Furthermore, grants can be utilised innovatively to unlock more capital from the private sector and local banking institutions. Using grants as guarantees could even unlock twice or three times the amount of capital the private investors initially intended to invest. This multiplier effect comes from the risk-cushioning that investors can rely upon to recover a portion of their investment in case of a default, enabling investors to provide more capital due to reduced risk of loss. Bernard echoed this point, illustrating the multiplier effect of using grants as guarantees.

"The amount of money that the Ikea Foundation invested through Greenmax Capital to establish the first loss facility will help unlock almost 15 times how much they put in there just by de-risking. It's not investing directly; it's just by derisking."

(Bernard, Research Organisation, Africa Lead Energy Access)

This section discussed the financial instruments used to invest in the two decades from 2000

to 2020 by public international investors. The majority of this financing was debt. Other financial instruments were either rare or provided in small quantities. The following subsection considers the evolution of these instruments between the capital paucity and capital growth stages and across the three investor groups.

4.4.1 Evolution of the Type of Capital Invested in the Energy Sector

Consistent with the general increase in the number of investments in the capital growth stage, the same growth is reflected in the individual financial instruments, with novel instruments introduced into the market during this stage. Notably, guarantees and hybrid instruments (mezzanine financing) were only used to invest in the latter stage. This change indicates an evolution of the market to diversify and attract new financial instruments to cater to existing capital needs. Standard loans had the highest jump (6157%) from the capital paucity stage to the capital growth stage, followed by standard grants (3668%) and concessional loans (778%). The standard loan had such a high increase because of the benchmark value. In this analysis, the benchmark value is the total amount of investment made using a specific financial instrument at the end of the capital paucity stage.

4.4.2 Debt Capital

In Kenya, the energy sector had a rapid absorption of debt at the commercial rate in the capital growth stage. In the capital paucity stage, concessional loans were ~eight times that of the standard loans. Understandably, this was a period of struggle for the country regarding capital-raising. With a concessional loan of US\$240.40 million against the US\$29.70 million of standard loans at the end of the capital paucity stage, it is no wonder the rapid growth of standard loans to US\$1858.35 million during the capital growth stage provided such a high cumulative percentage increase in the latter stage due to its low initial position. To place this in perspective, standard loans had a compound annual growth rate (CAGR) of 51% relative to concessional loans at 25.62% in the capital growth stage.¹¹ Alarmingly, the absorption of commercial rate debt was twice that of the concessional debt, which, in and of

¹¹ CAGR calculated here takes the amount of both concessional and standard loan total amount at the end of the capital paucity stage and uses that as the beginning value to evaluate the growth in the capital growth stage. The resulting CAGR is then used to forecast the 2020–2030 growth of both loans (should the same trajectory remain).

itself, raises the question of sustainability. Although debt is necessary, does an overwhelming amount at the commercial rate become a weak point in financing? Emerging economies should keenly consider the type of capital used to finance development, such as energy projects, especially capital channelled through the government; otherwise, the high cost of debt at the market rate becomes unsustainable, and general macroeconomic trends weaken the repayment capability of countries. If the same trajectory is maintained, commercial rate debt will soon overwhelmingly dwarf concessional debt, and ultimately, the energy sector will be financed by a more expensive market-rate debt.

Although commercial rate debt remains a crucial part of capital for energy companies, a case for more concessional financing should be made, given the added vulnerabilities of foreign exchange risk. Most importantly, this trajectory is contradictory to the global narrative of the role of public investors leveraging cheaper capital to link countries and companies to the broader capital resources of the private sector. The trajectory also risks using development as another source of wealth extraction from emerging markets without carefully considering the long-term commercial sustainability of companies working with a largely low purchasing power clientele.

Concessional financing may not be needed for all the widespread, proven and cheaper technologies. A principal investment officer at the IFC explained that, since some of the funded technologies are now mainstream, they may not need the concessional financing as they did initially. He provided the example of solar technology and its initial investment evolution compared with recent years.

“At the start, the economics were much more difficult. When I did the first solar project in South Africa, it was 35 cents per kilowatt hour. It was not affordable to countries like Kenya, and these projects were very few. Now, the economics are very different; we have people doing 2 cents per kilowatt hour. First, a couple of things have moved to make this mainstream; part of it is that the underlying technology has become cheaper. When doing a project, there are hard and financial costs. The hard cost of building the asset is now cheaper. When we started, the hard cost was much more expensive, and the financing cost was also expensive, because people would say this technology is not proven, and I need to be compensated for the risk (relative to the mainstream technologies such as hydro or gas at

the time). Those were the dynamics. New technologies were being provided with various incentives, fiscal and otherwise, and concessional financing could be accessed to blend and lower the project cost. They may not have called it green financing, but it was green financing. This enabled the economics of the green but more expensive projects to be doable, but they were still far from mainstream. But now, we do solar projects every other day, and they are now mainstream. I still label it as green finance, but it is now mainstream. Now, you can do it without concession because of the economics. Because of economics, hard costs and other things are proven to have gotten better. People are sharpened pencils over time; there are now many more builders, and equity returns that are required are sharper because more people are competing for the same opportunities."

(Reagan, Principal Investment Officer, IFC)

The case for concessional financing remains crucial, however, particularly for public investors and public borrowers. Furthermore, nexus areas, such as energy and agriculture, may need concessional funding. Nevertheless, increasingly, public investors may scale back concessional financing to the private sector since most of the proven green energy technologies are now mainstream, more common and cheaper.

4.4.3 Equity

Equity investments are quite rare from public international investors. The results indicate that DFIs invested the most in equity. Equity finance constituted 2.71% of all public investments made to the energy sector. This finance was provided by only six investors across the two decades, and EIB, FinnFund and Norfund provided 41.95%, 24.96% and 24.13% of the total equity public investments to Kenya, respectively.

Most of the equity investments were made by the Dutch Entrepreneurial Development Bank (FMO), the Finnish Fund for Industrial Cooperation Ltd (FinnFund), the Norwegian Investment Fund for Developing Countries (Norfund) and Commonwealth Development Corporation Capital Partners PLC (CDC Capital Partners PLC).

This confirms the DFIs' mandate, which has been private sector-focused from the early capital paucity stages. In contrast, MDBs, which have a broader mandate that, although it includes the private sector, often channel financing to public institutions. In this case, debt is

often the preferred capital to ownership and control instruments, such as equity. Examples of equity investment are the Olkaria II extension by EIB in 2005 and the Responsibility Renewable Energy Holding by Norfund in 2019.

4.4.4 Grants

Grants, although common, come in small amounts and are very competitive. Grants increased by 3668% from the capital paucity stage to the capital growth stage, although the quantity overall stayed low. Grants contributed 3.31% of the capital invested in the energy market across the two decades. Consistently, in the two capital-raising stages, grant investment deals were frequently provided by many actors, far more than any other financial instruments. In the capital paucity stage, 28 grant investment deals were made by 13 investors. In the second stage, 35 investors made 143 grant investment deals. Relative to other financial instruments, grant deals were ~2.5 times more in the capital paucity stage and ~1.5 times more in the capital growth stage. Although not commercial financial instruments, grants catalyse future commercial investments.

Emerging markets with many grants may indicate the following: a scarcity of commercial capital due to the lack of a suitable investment environment; preparatory and foundational work to study and evaluate the feasibility and viability of future energy projects that may absorb commercial financing; and strategic leveraging to unlock more private sector investment. These factors are not mutually exclusive; they often are synchronous. It is undoubtedly true that, in Kenya, there was a desperate need for commercial investments during the capital paucity stage. Therefore, much grant financing was needed to identify, assess and determine the commercial viability of companies and projects. In development language, they were identifying bankable projects. It is no surprise, then, that there was a high ratio of grant deals to commercial instruments. The grant increase in the latter stage may have been a natural growth, a continuation of what began in the capital paucity stage, augmented by the proliferation and increased interest of new and old investors.

An in-depth examination of the types of projects financed by grants revealed that investment prepared the way for the more rapid absorption of commercial financing (especially debt) in

the capital growth stage. Grants funded feasibility studies, technical assistance, training support, capacity development, technical advisory support, pilot projects and the promotion of energy technologies. Grants funded catalytic and enabling activities, often non-commercial but with commercial benefits.

4.4.5 Capital Preference or Strict Investment Mandates?

Investors have preferences, inclinations or strict mandates that influence the type of finance they provide. The results highlight that although multiple investors used diverse financial instruments to provide capital, many had a dominant financial instrument. To analyse this point, this research focuses on the “movers and shakers” of public investments in Kenya – the top 10 investors. The research also highlights striking examples outside this group. Kenya is among Africa's shining stars of capital-raising, with debt-fuelled growth in the energy sector. All the top-10 investors provided debt capital in large quantities, and debt was far more dominant than other financial instruments. However, a distinction exists: most investors provided concessional debt, except for the Ex-Im Bank of China, the US International DFC, and the IFC, which mainly provided standard loans. Although six out of the 10 investors have more than one financial instrument, their quantities are dwarfed by the debt capital. Given these results, this research argues that the energy sector in Kenya has absorbed significant debt, albeit concessional at times, but debt nonetheless. The sector is in dire need of greater diversity of capital. This diversity need not be equal across all the financial instruments, but certainly, more capital flows are necessary for the most impactful ones. For instance, guarantees, equity and grants may vary in quantity, niche and application. For example, although catalytic, grants need not match the rest, because they do not offer commercial returns to their investors. They are also very competitive and can only be leveraged for more commercial investments. Often, grants are used in supplementary ways: some investors use them to support the non-commercial arms of their projects or even fund prospective projects to conduct pilots and test viability.

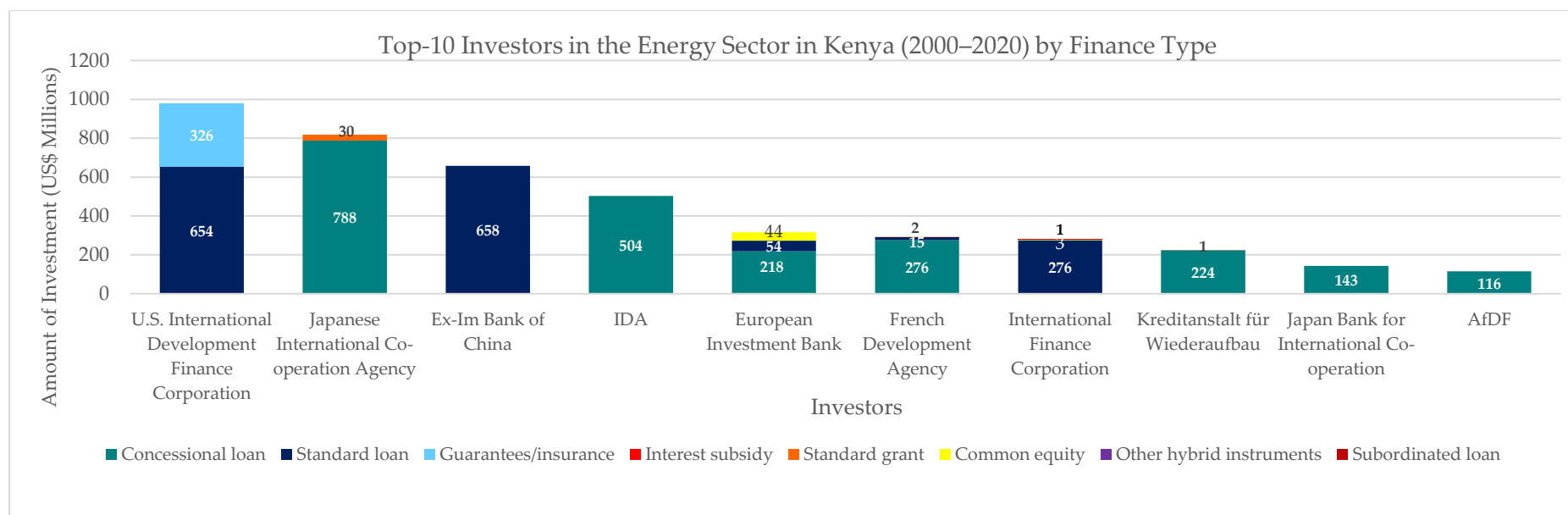


Figure 7: Top-10 Public Investors in Kenya's Energy Sector (2000–2020) by Finance Type

Figure 7, above, indicates that investors have an apparent inclination or preference for different types of capital, which may stem from strict strategic mandates. Pursuing financial instrument diversity is not a distant goal, as some actors have managed this.

Among the many debt capital providers, some stand out due to their significant contribution to investment diversity. For example, JICA is among the top grant providers in Kenya. Having provided 18.58% of the debt capital in Kenya, all of which was concessional, JICA also provided 19.85% of all the grants in Kenya. Although this figure is only 4% of JICA's total capital provision, it is a significant contribution, particularly among its peers of top-10 investors, whose grant provision was negligible or non-existent.

Guarantees, which constitute 6.75% (US\$326.20 million) of all public investments made to the energy sector in Kenya, were all made by the US International DFC. Almost all (98.62%) of the guaranteed financing was invested in wind technology projects: Lake Turkana Wind Power Plant (LTWP) US\$270.81 million in 2014, and Kipeto Wind Farm US\$50.89 million investment in 2018. In 2019, d.light Limited also secured a US\$4.5 million guarantee investment 2019 from the DFC, highlighting that constructing wind plants in Kenya had a high perceived risk relative to others. This point introduces the other component of this discussion: investment across different technologies.

This section discussed the type of capital used to finance Kenya's energy sectors. Although Kenya is an emerging market, it had a high and fast annual absorption rate of debt capital. Quintessentially, energy access and transition in Kenya are driven by debt. As a result, debt capital eclipses other types of capital provision. Unfortunately, this meagre diversity of financial instruments comes at the cost of addressing specific niche needs in the sector, which raises two key points: 1) there is a great need for capital provision through guarantees, grants and equity; and 2) is a predominantly debt-driven energy financing sustainable? Given the diversity of technologies in the energy sector, the research now examines the type of capital provided across these technologies.

4.5 Technology Analysis

This section explores the distribution of public investments to different technologies in greater depth. This aspect is paramount due to the discussion of energy transition and the keenness to achieve the United Nations' SDGs. The investment split between renewable and non-renewable energy sources was discussed earlier in this chapter. This research found that, in Kenya, the overwhelming majority (93.68%) of investments were channelled to RE sources. This finding provided an overview of investor support for Kenya's transition from non-renewable sources or its shift from an overreliance on climate-vulnerable energy sources, such as hydropower. Hence, the research now considers the investment breakdown according to technologies to understand this granularity, including the nature of investments in each technology, and identifies whether certain technologies attract specific financial

instruments.

The section further ranks the technologies based on the quantity of investment and examines the technology with the most financing. Geothermal technology was selected for a deep dive based on that criterion. The selection criterion for the most funded technology assumes that large quantities of financing indicate a certain success in capital-raising. This research seeks to understand whether overall capital-raising success masks other capital struggles. The study also considers the impact of favourable financing on a specific technology and its effect on Kenya's electricity mix. Before proceeding to this deep dive, the investment's disaggregation by energy technologies is discussed.

4.5.1 Public Investments in Energy Generation Technologies

Although public investments were made in approximately nine technologies, three dominated: geothermal, solar and wind. Geothermal energy received ~half of all the investments made in the two decades tracked by IRENA. Table 8, below, indicates that debt was used to fund most technologies, except for nuclear and "other non-renewables", exclusively funded through grants.

The table also reveals that guarantees constituted a significant portion of wind technology financing, at 44%. Equity financing, consistent with its overall trend, was small and, at times, almost negligible in some technologies, except for hydropower, which constitutes 6.80% of its capital stack.

Table 8: Type of Finance Invested by Technology between 2000-2020

Technology	Amount and Percentage of Financing Invested in Different Technologies		Type of Finance Invested by Technology					
	Amount of financing (US\$ million)	% of Total Financing	Debt	Equity	Grants	Guarantees and Other	Mezzanine Finance	Total
Geothermal energy	2301.4439	47.63%	97.81%	1.91%	0.28%	0.00%	0.00%	100.00%
Solar energy	739.7233	15.31%	97.52%	0.72%	1.14%	0.61%	0.00%	100.00%
Wind energy	728.2636	15.07%	51.60%	4.00%	0.02%	44.17%	0.19%	100.00%
Multiple renewables	385.4112	7.98%	64.60%	0.56%	34.84%	0.00%	0.00%	100.00%
Renewable hydropower	326.7178	6.76%	92.76%	6.80%	0.38%	0.00%	0.06%	100.00%
Fossil fuels n.e.s.	215.9949	4.47%	98.42%	0.86%	0.71%	0.00%	0.00%	100.00%
Oil	85.4507	1.77%	100.00%	0.00%	0.00%	0.00%	0.00%	100.00%
Bioenergy	45.4597	0.94%	91.19%	0.00%	8.81%	0.00%	0.00%	100.00%
Nuclear	3.7030	0.08%	0.00%	0.00%	100.00%	0.00%	0.00%	100.00%
Other non-renewables	0.0444	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	100.00%

Overall, debt continued to dominate in most technologies, with few attracting diverse financial instruments, indicating debt was the common and most accessible capital for the energy sector. However, wind technology is distinct, since a significant portion of its financing was guarantees (44%) and had a notable equity financing of 4%, further highlighting the scarcity of other types of capital in Kenya's energy market.

Reflecting on the leading position of geothermal, solar and wind technologies, a public investor interviewee reported the following:

"We are very bullish on Kenya specifically for solar and wind and, of course, geothermal because of its potential for baseload capacity in Kenya. But the mix of our portfolio would be a combination of the IPPs that are specifically on solar and wind and then also geothermal."

(Zuri, IFC, Investment Officer)

Access to capital resources has a tremendous impact and influence on the technology composition of a country's energy or electricity mix. Regardless of the investors' underlying reason for capital provision, natural technology preference, technology pull due to low risk, or enabling regulatory framework, the more the investment flows, the greater the country's electricity mix transformation. Does the amount of finance accessed by each technology correlate with the evolution of the country's electricity mix? From the results in Table 8, geothermal energy is of great interest due to the significant capital flows compared with the meagre investments in renewable hydropower. Equally important is the substantial and almost even matched capital flows to both solar and wind technologies. How did these capital flows shape the electricity mix in Kenya?

The evolution of Kenya's electricity mix strongly correlates with the magnitude of investment channelled to specific technologies. Kenya's energy mix and installed capacity have grown tremendously since 2010. Using 2010, the start of the capital growth stage, as a benchmark year reveals an increase in diversity of technologies, as well as significant growth in geothermal, wind and solar technologies in the electricity mix. To illustrate this growth, take, for example, the KPLC reported electricity mixes in 2010 and 2023 by KPLC in Table 9 below.

Table 9: 2023 vs. 2010 Kenya's Installed capacity

Technology	2023 Installed Capacity (MW)	2010 Installed Capacity (MW)
Geothermal	940	198
Hydropower	839	758.6
Wind	436	5.1
Thermal	615	510.2
Solar	210	
Imports	200	
Biogas	2	
Off-grid Thermal	42	
Off-grid wind	0.55	
Off-grid Solar	3.39	
Total	3287.94	1471.9

Through significant public investment, geothermal technology overtook hydropower as the lead energy technology in Kenya. This change is partly because of the following reasons: enabling legislation and regulation changes; increased private sector participation

promoting different technologies; Kenya's commitment to reduce overreliance on hydropower, given its vulnerability to climate change; the country's rich geothermal resources; and, as demonstrated in Table 8, significant capital flows. Regarding the latter point, how does a technology growth rate relate to the amount of investment received? Between 2010 and 2023, geothermal power grew by 375% to 940 MW following a significant investment of US\$2,301.44 million. Similarly, wind technology confirmed its critical contribution from a small but notable amount to providing 13% of the total electricity mix. From 2010 to 2023, commensurate with the significant investment of ~US\$728.26 million (15.07%) of all public international investments in the energy sector, wind grew by 8,449%, from 5.1 MW to 436 MW. This growth stemmed from investments in wind power infrastructure, such as the LTWP, Kinangop Wind Park and Kipeto Wind Farm. Similarly, solar technology was a new introduction to the national electricity grid since it was not used to generate electricity in Kenya during the capital paucity stage.

However, in the capital growth stage, in June 2014, the SRCC became the first solar IPP to connect to the national grid. The company later signed a PPA with KPLC in October 2015.¹² Since then, solar technology's contribution to the grid has grown to a total installed capacity of 213.39 MW. Solar, similar to wind and geothermal technologies, amassed a significant investment of US\$739.72 million with support from Kenya's political and regulatory environment, which wanted to diversify its electricity mix technologies and transition from some old thermal plants.

The growth pathways of the three technologies differ, either by the type of finance provided or by the implementing institutions, though, at times, they have similarities. As discussed in the previous section, geothermal and solar were overwhelmingly financed through debt (>97%), whereas wind technology had a broader variety of financial instruments. Wind was funded through debt – 51.60%; guarantees – 44.17%; and equity – 4.00%, among others. These differences are partly attributable to the financiers' investment mandates, project or company (ownership) structure, investors' risk appetite, unique technology risks, financing preferences, and the broader regulatory framework. Other challenges persist, such as delays in licensing and slow PPA signing processes. Take the SRCC example. Although the plant

¹² <https://www.businessdailyafrica.com/bd/corporate/companies/strathmore-eyes-kenya-power-earnings-2156870>

was connected to the grid in early 2014, it was not until 2015 that it started to make revenue from the sale of electricity. According to KPLC records, even after the PPA signing, it was not until 2019 that Strathmore and another solar power company – Garissa Solar Power Plant – were recorded as fuel purchase costs to KPLC, indicating energy purchase (KPLC, 2019, p. 52).

The section above highlights the relationship between the capital flow amount and the technology mix in the national grid. Although capital flow is not the only key contributor to this growth and relies on many other factors, it is a good predictor of future technology mixes and growth. This factor highlights the tremendous growth of wind and geothermal technologies in the electricity mix and the significant introduction of solar technologies. In a sense, the magnitude of capital flows is a good predictor of how the electricity mix will change and evolve in the future. Contrasting hydropower technology with the above three technologies, the results indicate that although hydropower did not shrink, it only grew marginally. While the country had an early reliance on hydropower following its independence, low investment (6.76%) resulted in only an ~11% increase, from 758.6 MW in 2010 to 839 MW in 2023. Similar to hydropower, thermal plants' contributions to the electricity mix reduced from ~34.64% to 20.24%. This result can also be attributed to the low capital flows to non-renewable energy sources discussed at the beginning of this chapter. The long PPA contractual periods of between 20 and 30 years mean technologies that do not receive significant financing continue to produce electricity until the end of their contractual period, when this may be renewed or, if old, decommissioned. Hence, to phase them out is not instantaneous and may take decades.

Across the top three funded technologies, an examination of the financiers, the funded projects and the capital mix highlighted critical differences in technology financing preferences. In the next section, we use the geothermal sector to understand public investments in Kenya. Compared with other technologies, geothermal in Kenya has a good balance of participation from state-owned GDC and KenGen and private IPPs, such as OrPower4 and Sosian Energy Limited. Geothermal technology was among the early technologies adopted and used by IPPs, and, as demonstrated in the earlier discussion, it is the most financed technology by foreign public investors. Moreover, being the most funded

technology, is this a success story, or do other capital issues persist? The following section focuses on KenGen and GDC to highlight the public investment dynamics (partially) in national public utilities and IPPs.

4.6 Geothermal Financing in Kenya

The following section explores geothermal energy generation by considering some differentiated capital advantages and challenges across the national public utilities and the IPPs. The section builds on the previous discussion that identified geothermal technologies as the leading funded technology in the country. The examination begins with a brief introduction of national public utilities, the GDC and KenGen, then moves on to discuss the capital-raising advantage of national public utilities extended by the government, the role of IPPs in generation and the niche filled by DFIs in providing guarantees to IPPs.

4.6.1 The Geothermal Development Corporation (GDC)

The GDC, a state-owned company, is fully mandated for exploration and drilling, including the highly capital-intensive and risky stages of geothermal energy exploration. The company then sells steam to power producers, such as KenGen or private IPPs, who build power plants or use mobile wellheads to generate energy. In 2023, KenGen signed a memorandum of understanding (MOU) with the GDC, giving KenGen the right of first refusal to geothermal wells drilled by the company. This MOU provides KenGen with an advantage over its private competitors,¹³ continuing a long-running, informal tradition: without a set of selection criteria for new energy generation development, IPPs are invited to build only after KenGen is unable to or declines (Eberhard, Gratwick & Kariuki, 2018). This tradition further cements the state's power to control geothermal energy resources, since the government has a majority share in KenGen and wholly owns the GDC.

Although state-owned companies explore, drill, and generate geothermal energy, critical private sector actors (IPPs) exist, such as Sosian Energy, OrPower22 and Quantum Power.

¹³ <https://www.businessdailyafrica.com/bd/corporate/companies/kengen-tightens-grip-on-geothermal-wells--4105230>

Financial resources for state-owned companies and IPPs are vastly different. The GDC's 2019 annual report revealed their sources of financing: the Exchequer, revenue from steam sales and development partners. For example, that year, the GDC received KES 2.01 billion from the Exchequer and other financiers and KES 4 billion from steam sales and the Exchequer's recurrent budget. In the financial year 2018/2019, the GDC's budget composition was Exchequer – 24%, steam sales – 55% and donors - 21%.¹⁴ The company has previously been funded (US\$5 million) by KfW and the African Union Commission through the Geothermal Risk Mitigation Facility (GRMF) to develop 1065 MW by 2030.¹⁵ The GDC works closely with KenGen, and the next section provides more information about this company.

4.6.2 Kenya Electricity Generating Company PLC

In 2023, geothermal energy was the leading energy technology in Kenya's electricity mix (CIF & MOEP, 2023). The Electric Power Act No. 11 of 1997 liberalised the power sector in Kenya, paving the way for IPPs to enter geothermal generation, a role that, until that point, had only been reserved for KenGen. KenGen is a partially state-owned parastatal, 70% by the National Treasury, 6.48% by Kenyan institutions, 10.61% by local individuals, and 12.91% by foreign investors (KenGen, 2023). KenGen is an important institution in Kenya's electricity mix because it owns and operates 60% of all the installed power capacity and provides 85% (799 MW) of the total geothermal energy and 98.45% of the hydropower (KenGen, 2023). In 2010, KPLC purchased 1054MW (~72%) of the total purchased power (1473MW) from KenGen, and IPPs supplied the rest. The minimal reduction in KenGen's role in the electricity mix is not because of a decline in its operation; if anything, KenGen has continued to grow. The shift from KPLC purchasing 72% of its power from KenGen in 2010 to KenGen operating 60% of the country's installed capacity indicates the growing role of IPPs, further highlighting an increased role of the private sector through both domestic and mainly international investors.

KenGen, the largest provider of geothermal energy generation, has explored many financing sources over the years. KenGen has been funded by its internal retained earnings, DFIs, local

¹⁴ [https://www.gdc.co.ke/annual_reports/GDC%20ANNUAL%20REPORT%202019%20SOFT%20COPY%20\(1\).pdf](https://www.gdc.co.ke/annual_reports/GDC%20ANNUAL%20REPORT%202019%20SOFT%20COPY%20(1).pdf)

¹⁵ <https://www.gdc.co.ke/assets/docs/pressreleases/GDC%20wins%20KSh%20500%20million%20grant%20for%20geothermal%20exploration%20from%20African%20Union.pdf>

capital markets, international project finance banks, and government grants channelled through the MOEP (Saitet & Muchemi, 2015). Most projects are debt-financed, although KenGen has raised equity financing through the initial public offering (IPOs) and its stock trading on the Nairobi Stock Exchange (NSE). Triangulating the IRENA dataset with KenGen's 2023 annual and financial report and the 2023/2024 national budget summary revealed that KenGen has several publicly guaranteed debts. The 2023/2024 national budget summary lists that KenGen has seven publicly guaranteed debts (five from Japan and two from Germany), more than any other company in Kenya. Five out of the seven guaranteed debts are for hydropower, and two are for geothermal power projects, including rehabilitation and expansion.¹⁶ As of June 2023, KenGen's debt portfolio was 24.55% government-guaranteed loans, 67.39% on-lent loan facilities¹⁷ and 8.04% direct borrowing.¹⁸

4.6.3 The Unique and Reserved Capital-Raising Advantage of Public National Utilities

National public utilities have the unique advantage of accessing government-guaranteed loans, which lower the cost of capital, providing capital affordability and a competitive advantage. Take KenGen's example; the interest rates for the guaranteed loans range from 0.20% to 2.6% relative to higher interest rates of the on-lent loan facilities and direct borrowings, which ranged between 0.20% and 5.1%. Certainly, government-guaranteed loans help access capital at a low cost (KenGen, 2023). Notably, this advantage is only extended to state-owned companies and, in the case of KenGen, by DFI lenders, such as JICA and KfW. Although accessing government-guaranteed loans brings the cost of capital down, the national debt ratio influences and delimits the amount of debt that can be borrowed; hence, this is a finite advantage contingent on the government's overall borrowing for development (Saitet & Muchemi, 2015). Nonetheless, this system has offered relatively cheaper capital to national utilities and a competitive advantage against the IPPs.

The government has a long-standing position of not extending guarantees to IPPs. For

¹⁶ https://www.treasury.go.ke/wp-content/uploads/2023/06/Budget-Summary-for-the-FY-2022_23.pdf

¹⁷ On-lent loan facilities are entered into by the GOK with DFIs and subsequently passed down to the company through subsidiary loan agreements.

¹⁸ This was calculated using the 2023 KenGen annual and financial report figure of KES148,866,024,000 (this figure excludes accrued interest of KES 985,782,000).

example, the government does not guarantee against default by national utility companies, such as KPLC. The GoK's enduring position is that IPPs ought to be financed and guaranteed separately, and although this was contentious to developers, the GoK firmly maintained this position (Eberhard et al., 2018). Newell and Phillips emphasise this point by highlighting the MOF's defiance to provide government guarantees to the private investors against the default of electricity sector institutions, such as KenGen, KPLC or KETRACO, by stating they were "refusing to 'bow to the private sector'" (2016, p. 45). In the absence of government guarantees, MDBs and DFIs filled this gap. Moreover, MDBs and DFIs have played a key role in providing partial guarantees to IPPs, mainly because of the low KPLC default risk (Eberhard et al., 2018). This system has given IPPs the confidence to generate and sell power to KPLC.

Since most financing is internationally sourced, it is mainly done in foreign currency. For example, KenGen's borrowings were in US\$, euros or JPY. Although KenGen obtained cheaper capital relative to other sources, financing provided by DFIs also bears an FX risk.

4.7 Persisting Risk and Capital-Raising Challenges

4.7.1 Bureaucracy and Risk Weighing

DFIs play a critical role in providing capital. These institutions can offer large investments with concessional terms of low interest rates, lowering capital costs. However, this is not a quick process and is usually plagued by long sign-offs and bureaucratic procedures that often delay projects. This has undoubtedly been the case with some geothermal wells struggling for financing for up to 10 years. This issue drove an intervention to connect mobile wellheads and generate power while awaiting financing to build conventional power plants (Saitet and Muchemi, 2015). DFI provision of patient capital with long tenures requires thorough due diligence to ensure organisations comply with their policies and industry best practices. Due diligence is done to ensure compliance with the law and avoid unethical practices or harm to communities. One interviewee highlighted the following:

"We've been in cases where people didn't do their due diligence, and they acquired land that belongs to the community. And then, down the line, you realise you cannot actually develop the project, and you have already committed resources. So, we don't want this kind of problem."

(Walter, Regional Director-East Africa, DFI)

Risk is a significant consideration in investment for geothermal energy generation, because surface exploration and drilling stages have no guarantee of success. The government finances the risky early stages, and DFI finances the later stages, such as power plant construction, feasibility studies and PPAs (Saitet & Muchemi, 2015). Government financing is vital because funding the high-risk, capital-intensive stages reduces the pass-through cost charged to Kenyan citizens (Saitet & Muchemi, 2015). The pass-through cost is often agreed upon in the PPAs. This is a strong case for encouraging and mobilising public domestic financing from the government, because it reduces the final energy cost transferable to consumers. However, this is a challenge because the government has limited financial resources and tends to have many competing national development needs.

The other source of finance is direct borrowing from international project finance banks, which may use the balance sheet as collateral. The benefit of this strategy is that it has a quicker sign-off. Furthermore, the collateral boosts investor confidence, reducing the default risk priced into capital cost, reducing the interest rate and, overall, the cost of capital. However, companies ought to be doubly keen on this approach to avoid an overly leveraged balance sheet, which could lead to higher financing costs in the future or even struggles to access financing. This point especially applies to companies obtaining debt through hard foreign currency, as big changes to currency devaluation can lead to a high leverage ratio due to increased book value in local currency. Local companies collect revenue in local currencies; if the same company obtains debt in foreign currency, its value fluctuates depending on the local currency value. If and when the local currency is devalued, the value of foreign debt increases. Since foreign-denominated debt is recorded in local currency value, when the local currency is devalued, that change must be reflected in the financial books. Hence, its book value may increase, limiting the company's ability to raise more debt if the limit ratios are exceeded.

Given the macroeconomic cycles in a country, currency devaluation may happen for many reasons. Regardless of the reasons, depending on devaluation extent, it may have a mild or severe impact on institutions that heavily borrow in foreign currency. Take, for example, 2nd January 2019, 108.8322 Kenyan shillings(KES) were exchanged for 1 US\$. In 2024, five years

later to the day, 156.9853 KES was exchanged for 1 US\$. In short, the KES weakened by 44% against the US\$ in five years.¹⁹ This phenomenon is not unique to Kenya; similar challenges have persisted elsewhere in Africa, such as Nigeria. In approximately the same period, from January 2019 to 2024, the Nigerian naira weakened against the dollar by ~179%, and later in the year, by 88%, leading to a total devaluation of 423% from January 2019 to September 2024.²⁰ Institutions with long-term debt and long tenor may withstand periods of high currency devaluation in the hope of improved economic performance that strengthens the KES (although the KES seems to have consistently weakened against the US\$ for a long time). However, those institutions whose debt maturity coincides with the great devaluation risk bankruptcy, as some may not have sufficient money in local currency to pay back the principal and interest in foreign currency. This situation can lead to declaring bankruptcy, operation reductions or, if lucky, debt restructuring.

However, borrowing directly may not be an option when some investors are risk-averse and prefer channelling the investment through the government.

4.7.2 Inevitable Diminishing Support for Capital-Raising from the Government

In some cases, DFIs want to avoid lending money directly to companies and prefer to channel it to the government, which later provides the same financing on subsequent subsidiary loan agreements, called “forward lending or on-lent loans”. Government-to-government borrowing or government-backed guarantees face a fierce challenge against the national debt ratio limit. This issue is undoubtedly the case for Kenya, where, as of June 2023, the public debt as a percentage of GDP was 70.8%. This figure is against the newly set anchor debt limit of 55% public debt as a percentage of GDP (The National Treasury and Planning, 2023). This, therefore, could indicate slowed borrowing by the government in general and, consequently, fewer guaranteed loans to public utilities, such as KenGen, in the medium-term. There are possible short- to medium-term implications. This view is in line with Michoud and Hafner (2021), who state that although investments backed by government guarantees provide a

¹⁹ <https://www.centralbank.go.ke/rates/forex-exchange-rates/>

²⁰ <https://www.cbn.gov.ng/rates/ExchRateByCurrency.asp>

competitive advantage, financial constraints, competing national interests and poor creditworthiness may limit their issuance, all to the disadvantage of state-owned national utility companies.

To fund future growth opportunities, companies such as KenGen may have no option but to increase direct borrowing, which is moderately expensive. This option creates highly leveraged national utilities. Conversely, companies may also choose to slow their growth. This choice is unlikely, given that the company has ambitious goals for expansion. In the unlikely event the company slows its growth, this may also lead to an even greater participation of IPPs in geothermal generation. However, this situation is not straightforward, as reducing government financing could not only lead to higher energy costs passed on to Kenyans but may also lead to an overall slowed growth in the geothermal sector due to a lack of financing for the risky stages of exploration and drilling. Finally, MDBs, DFIs and related organisations are known to provide strict financial covenants, which are often tracked against leverage ratios, current ratios, co-financing percentage, etc. Upon hitting the ceiling of such financial covenants, a company is not allowed to add debt to its balance sheet, as it may face certain agreed-upon consequences, and often, some companies see this as limiting access to raising finance. KenGen has a leverage ratio threshold of 70% and a self-financing ratio²¹ of >25% (KenGen, 2023). Given these uncertainties and the limits of government support to national utilities in capital-raising, the next section considers the growing role of IPPs and their contribution thus far.

4.7.3 The Niche Role of IPPs and Contribution to Energy Generation in Kenya

Independent Power Producers (IPPs) are critical in generating geothermal energy and selling energy to KPLC. IPPs²² constitute ~35.92% of Kenya's installed capacity, and in recent years, their energy sales to KPLC have increased and continue to grow (KPLC, 2023, p. 222-24; KPLC, 2019, p. 177-79; KPLC, 2017, p. 179-81). Figure 8, below, illustrates that most of KPLC's energy supply is from KenGen and IPPs (KPLC, 2017; KPLC, 2019; KPLC, 2023). IPPs' energy

²¹ Minimum contribution to project cost by the borrowing company.

²² The abbreviation IPPs is often also used to refer to independent power producers or projects. IPPs are non-utility energy generation developers who are mainly privately financed to construct, develop, own and operate power plants, selling the energy to a distribution utility company through long-term power purchase agreements (PPAs).

sales to KPLC increased from 22.11% in 2012/13 to 33.55% in 2022/23. KPLC energy purchase from KenGen declined from 73.81% in 2012/13 to 60.39% in 2022/23. This decrease was not because KenGen sold less energy but because KPLC purchased more energy from IPPs to cater to its growing customer connections. KPLC bought, on average, 26.23% of its total energy from IPPs in the past decade (2012/2013–2022/2023), with the majority of its purchases (70.84%) coming from KenGen. However, year-on-year changes indicate an inverse relationship between KenGen and IPPs. Figure 8 reveals that in the years when KPLC purchased less power from KenGen, approximately the same percentage of energy was purchased from IPPs. This situation certainly has been the case for most years, except for 2019/20 and 2022/23, when such differences in purchases were covered by other sources. OrPower 4 Inc. is an IPP that uses geothermal energy to generate energy and sell it to KPLC; it is also one of the investment recipients listed in the IRENA database.

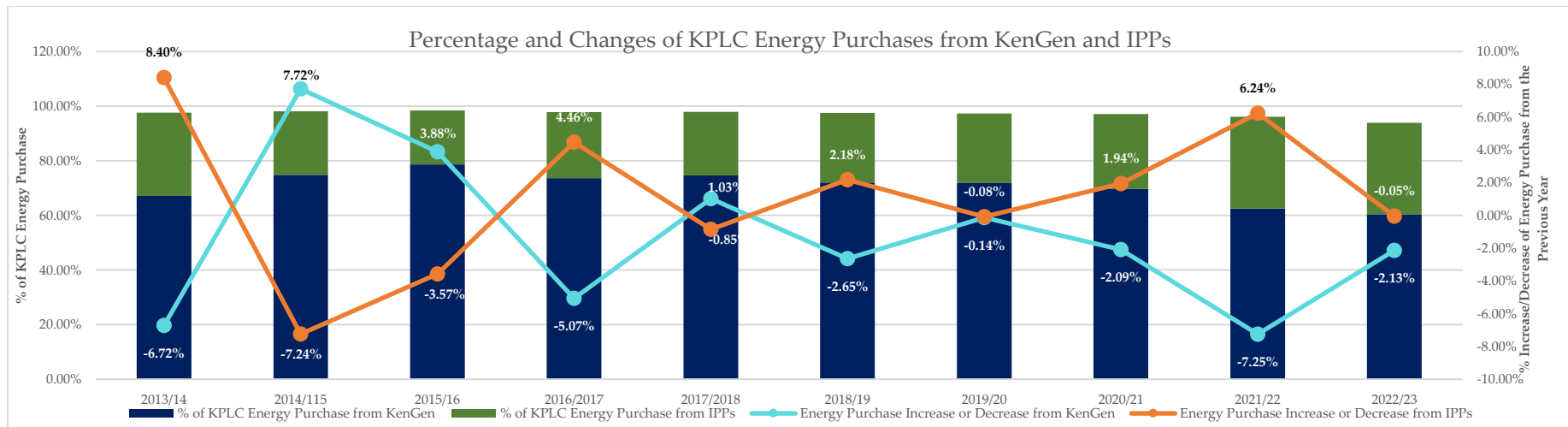


Figure 8: Percentage and Changes of KPLC Energy Purchase from KenGen and IPPs

Orpower is an IPP and a subsidiary company fully owned by the Israel/USA company Ormat Holding Co. It was one of the pioneer IPPs in Kenya, initiated by KPLC in 1995 through internationally competitive bids (ICBs). As of June 2023, OrPower 4 Inc. has provided 15.59% of the geothermal energy sold to KPLC, constituting 21.09% of the IPP sales to KPLC (KPLC, 2023). Although IPPs are not new to energy generation in Kenya and have played a critical role since the late 1990s, their role has expanded. While IPPs are often considered private entities, such as OrPower, fully owned by Ormat Holding Co., this is not the case for all. Some IPPs, such as Tsavo Power Company Ltd and Rabai Power Ltd, are or were owned partially by DFIs, who are owned by their respective owner governments²³. Therefore, IPPs in Kenya are either privately owned or have a PPP structure due to equity or debt held by public institutions, either directly or indirectly. The PPP structure was enabled by the Public-Private Partnership Act of 2013, which was a regulatory framework to enable innovative financing mechanisms for IPPs and collaboration with public institutions. A PPP may include joint ventures and opportunities for IPPs to build-own-operate and transfer (BOOT) or BOT.

Although the first IPPs²⁴ in Kenya started as a crisis-mitigation measure for the power crisis in 1996, resulting from a drought that affected many hydro plants and meant construction delays of other plants. OrPower was a beneficiary of the newly liberalised energy market that also invited unrelated stopgap IPPs to bid (Eberhard, Gratwick and Kariuki, 2018).

Traditionally, most IPPs preferred a project financing structure, often used for risky business ventures financed through non-recourse loans. Globally, with the maturing of the sector, this preference is changing to balance sheet financing, with project equity declining from 40% in 2013 to 10% in 2020 (CPI, 2023). An energy developer echoed this point:

“We pioneered the model of creating special purpose vehicles [SPV] (...). I think it’s evolving now; we are moving more and more towards raising capital on our own balance sheet”

(Jack, Energy developer, Solar Minigrids)

²³ <https://www.tuko.co.ke/429573-unmasked-faces-private-power-generating-companies-selling-electricity-kenya-power.html>

²⁴ The first stopgap IPPs were made in 1996 in Kenya and had seven years of tenure: Westmont (46 MW) and Iberafrica (44 MW). Iberafrica was partially (20%) by the KPLC pension fund. Eberhard A., Gratwick, K., & Kariuki, L. (2018). ‘Kenya’s lessons from two decades of experience with independent power producers.’ *Utilities policy*, 52, pp. 37–49.

In the earlier days, IPPs demanded default or termination risk mitigation tools when selling power to the high-risk-perceived KPLC. KPLC used escrow accounts, advance payments, standby letters of credit and comforts as a guarantee against default to IPPs. However, this approach could not be sustained; over time, the company built credibility by consistently paying its debts, reducing default and termination risks perceived by IPPs. KPLC achieved this mainly because of nearly cost-reflective tariffs, effective collection and billing processes, and the use of prepaid metres that reduce customer defaults, among other factors. Regardless, some IPPs still consider it prudent to insure against this risk. IPPs such as OrPower have received guarantees either from MDBs or DFIs. OrPower received multiple guarantees from the Multilateral Investment Guarantee Agency (MIGA) from the 2000s to 2010s²⁵. In the early stages of energy sector reform, certain risks, such as political regulation, expropriation, war, construction, default, contract breach, and transfer restriction, desperately needed guarantees. This situation is not unique to geothermal technology; other IPPs, such as the LTWP, received a partial risk guarantee from AfDB worth US\$24.69 million²⁶ (Eberhard, Gratwick and Kariuki, 2018).

This section stressed the increasing role of IPPs in energy generation and highlighted the energy sales relationship between the partially owned national generation utility and the IPPs. The section also discussed the evolution of the KPLC's relationship with IPPs and the confidence built over the years. Most importantly, Kenya's growing reliance on private developers was outlined.

4.8 Conclusion

This chapter discussed Kenya's public investment journey from 2000 to 2020, informed by the IRENA dataset. The discussion explored investment trends, influential actors, the nature and form of these investments, and the technologies financed. Relative to other countries in Africa, Kenya ranked seventh regarding capital flow, having received ~US\$5 billion in that period. The research found that the overwhelming majority of the investments funded RE

²⁵ <https://www.miga.org/project/orpower-4-inc>

²⁶ <https://www.afdb.org/en/news-and-events/afdb-facilitates-energy-diversification-and-access-to-clean-energy-with-the-approval-of-a-eur115-million-loan-to-turkana-wind-power-project-in-kenya-11704>

technologies. Moreover, most of these investments came from a small group of 10 investors. Strikingly, capital-raising in those two decades can be best categorised into two stages: capital paucity and capital growth.

The capital paucity stage was the 10 years from the start of 2000 to the end of 2009. In this era, Kenya raised US\$327 million through 39 investment deals from 18 investors. This first decade was characterised by capital-raising struggles stemming from the requirements of international public donors/investors: restructuring, the establishment of an independent regulator, private sector participation and competitiveness in the energy market. In response, and in a desperate attempt to fulfil these requirements and ease capital-raising, Kenya embarked on regulatory reform in the mid-1990s, supported by some of the public investors. Kenya maintained a vibrant legal and regulatory momentum across all four key areas. These regulatory reforms resulted in energy market liberalisation and paved the way for private sector participation, especially in energy generation. Although these reforms began before the start of this era, the country reaped its benefits many years later because of the slow investor confidence build-up that came from the enacted laws, coupled with the lag between policy formulation, law enactment and execution. Investors' natural risk aversion and slow behaviour adaptation meant the benefits of the regulation reform were reaped in the capital growth stage.

The capital growth stage ran from 2010 to 2020 and was characterised by significant capital flows relative to the capital paucity stage. This period saw tremendous growth in investment deals, investors and the amount of capital deployed in the sector: a 194% increase to 53 investors, a 505% increase to 236 investment deals, and a 1274% increase to US\$4,504.28 million. The sudden surge of investment deals, capital and frequency in the capital growth stage indicates increased investor confidence, engagement and interest in Kenya's energy market. This change was clearly demonstrated by the country's ability to retain early investors while facilitating the entry of new investors into the market.

Kenya's energy market investments came from large, medium and small investors. The research found that ~90% of investments came from 10 investors out of 55. These 10 can be considered the "movers and shakers" of the sector in investments. The second group,

comprised of investors ranked between 11 and 20, was considered “builders” for their moderate contribution. Finally, the third group comprised 35 investors, who provided 2.46% of the capital and are the “investment supporters”. Kenya received investments from these three groups and grew consistently from the capital paucity stage to the capital growth stage. The “movers and shakers” had the most vibrant engagement, making twice as many investment deals as those in the other two groups. The multiplicity of investment deals indicates a regular capital flow, which signals the frequent engagement of stakeholders within the sector. The research also analysed the type of capital used to invest.

Kenya’s energy market is heavily financed by debt and, alarmingly, the rapid absorption of commercial-rate debt. Although debt provision was mainly through concessional terms (55%), the standard loan at a commercial rate increased by 6157% from the first stage to the second and, in the latter, grew at a compounded annual growth rate of 51.47%. This growth was twice that of the concessional loans at 25.62% and is set to overtake concessional financing in 2022, should the same trajectory remain. This is paradoxical at best, and, at worst, it is unsustainable. Although the struggles regarding capital access in emerging markets are well known and documented in national documents, the need to raise more financing should never overlook the type of capital, whether to public or private channels.

Furthermore, although some of the technologies are now perceived by investors as mature and may not require pure concessional financing, given other vulnerabilities, this research argues that concessional financing should be prioritised, especially when debt is mainly provided using foreign currencies. Coupling high-cost debt with volatile foreign exchange risk exacerbates the risks of local and foreign companies collecting revenue in local currencies. A vital aspect of this issue is not debt but affordability, since companies inevitably must obtain debt for their companies. However, given the vulnerabilities of emerging markets, a clientele base of low-income households with low purchasing power and governments’ highly leveraged national debt means concessional financing needs to grow and not be dwarfed by commercial rate loans. If the goal is to achieve all sustainable goals collectively and not destroy the capital-raising abilities of countries, then concessional financing should grow aggressively beyond commercial loans. In addition to the sectoral

analysis of the capital provided, greater nuance is revealed via a granular technology disaggregation. Although Kenya's energy market has succeeded in capital-raising in many ways, niche and localised struggles persist in different subsectors.

This research found that, even on broader, successfully funded technologies, such as geothermal, high-risk stages, such as exploration, need more financing, especially concessional financing. Considering the broader SDGs, concessional financing is key in ensuring that access to funding in one sector is not only affordable but also catalytic and can be leveraged. In its absence, companies face higher risk with commercial rate debt, which may turn into repayment struggles or, worse, defaulting, which can lead to lower credit ratings, meaning companies struggle even further to access capital. Without a strategic evolution of capital provision, the high and rapid absorption of commercial rate debt lends itself to the intrinsic vulnerability of capitalistic accumulation. The emerging markets will become an accumulation mining ground for capital extraction, leaving emerging markets with more vulnerabilities and less-than-expected development due to companies' lack of commercial sustainability. However, despite the dominance of debt, catalytic and enabling capital were provided.

Although the type of capital provided was diverse (equity, guarantees, grants, and interest subsidies), other hybrid instruments collectively made a meagre yet notable financing contribution to the energy sector. It is also noteworthy that the diversity of financial instruments grew across the two periods, indicating an evolving responsiveness to the capital needs of the sector. The lack of guarantees and grants is a hidden impediment to unlocking more private sector capital and may be vital in attracting capital from local financial institutions. Given the risks in emerging markets, guarantees such as first loss can help unlock and accelerate capital access. The small and competitive nature of grants means there is a need for innovative utilisation to unlock more capital, especially local financing, which may reduce foreign exchange risk for companies. However, this approach ought to be taken with caution to avoid an absolute sectoral shift of grant financing to equity and debt, only to forget the enduring need for grants to companies to finance project pilots, feasibility studies, capacity-building, technical assistance, and advisory services. Most importantly,

catalytic financing, such as grants and guarantees, is direly needed. Given the challenges facing companies in raising capital, this research revealed the role of government guarantees in unlocking less costly capital for state-owned companies, such as utilities.

The research highlighted the niche advantage of national utilities in accessing cheaper capital through government support. Given the government's borrowing ceiling, this advantage is under threat. In addition to this challenge, the research identified other challenges that highlighted that some investors are averse to direct capital provision to national utilities and may limit the amount of capital that such utilities can raise. Other investors were plagued by slow bureaucracy. However, some investors regarded this issue as a process of vetting and ensuring that proper due diligence is comprehensively completed before capital commitment. Other persisting challenges include foreign exchange risk and strict investor covenants. All these challenges highlight that although capital-raising in Kenya has improved, the sector continues to face substantial challenges, coupled with the diminishing capacity of the government to support national utility companies to receive cheap capital, which strongly indicates a future in which the country relies heavily on the private sector. This situation is illustrated by the increasing role of IPPs in energy generation. The research also found that IPPs significantly supplemented energy generation in Kenya. The growing role of IPPs in the energy sector indicates their essential contribution and is emblematic of the growing role of the private sector.

The findings in this chapter have several implications. First, energy sectors in emerging markets are shaped and influenced by a few investors, and a country's progress in capital-raising is indicative of its responsiveness to the demands, at times wishes, of investors rather than a mutual alignment of independent and intrinsic of interests and goals. Second, this chapter provided strong evidence that capital access should not be viewed solely through the lens of the quantity of capital flows, lest it lead to unsustainable financing. The high commercial debt absorption demonstrates this point, coupled with other niche capital challenges that exposed dire capital access gaps and a need for catalytic financing. The aggressively growing commercial rate debt uses emerging markets as an accumulation mining ground of net capital extraction. Third, the role of the private sector will continue to

increase in grid and off-grid energy solutions. Given the government's reduced borrowing capacity due to the country's debt ceiling, this situation will force national utilities to source more expensive capital, which will be passed on to citizens, making energy costs more expensive. Having discussed public investments in this chapter, the following chapter focuses on private investments in the energy sector.

Chapter 5: Historical Private Investment Trends of the Energy Sector in Kenya

5.1 Introduction

This chapter narrows its focus to energy sector private investments. These are investments made mainly by private investors, but most importantly, they are made in privately owned energy companies. The decentralisation of energy distribution services provision has resulted in privately owned companies, in addition to the IPPs studied earlier, selling energy products directly to consumers or offering supporting services. The corporate ownership structure of private companies, local and foreign, means they attract private investments. This chapter continues the investment discussion from the previous chapter on public investment, which highlighted that solar was the second most invested-in technology. A closer look at this also revealed some investments from public sources were invested in private off-grid solar companies. To bridge this discussion, private investment analysis focuses on solar technology, mainly off-grid solar products, to understand the historical trends of private investments. This focus is the second part of answering the first research question: Who are the influential actors enabling capital access in the energy sector in Kenya, and how do they invest?

This section utilises the GOGLA²⁷ dataset and interviews with key actors in the energy sector. Regional, country, and company-level analysis helped understand (mainly) private investments made in private energy companies. At a regional level, a comparative analysis of Kenya, Uganda and Tanzania highlights Kenya's capital access performance in the off-grid sector and showcases capital-sharing and -distribution among companies across those three countries. At a country level, the research focuses on off-grid companies in Kenya to analyse the following factors: the amount of investments made to each company, the size (lifecycle) of the companies, the financial instruments used to invest and the mode of capital access. At the company level, and to understand the uneven investment outcome that results in the dominant and subordinate nature of some companies, this research reviewed the frequency

²⁷A key point is that although the GOGLA data mainly document private institutional investors, some investments come from public sources, such as DFIs.

of investment deals (number of investment deals), the number of investors in each company, and the investor relational leverage and commitment.

This chapter is organised into six key subsections: 1) a regional comparative analysis of capital-raising in Kenya, Uganda and Tanzania; 2) East African companies' capital distribution and -sharing in Kenya, Uganda and Tanzania; 3) the dominance of a few international companies in capital-raising; 4) the struggle of seed and start-up companies regarding accessing capital; 5) the financial instruments used to finance off-grid companies; and 6) the modes (or pathways) of capital access. Cumulatively, this chapter focuses on discussing Kenya's role and pioneer advantage in capital access for the off-grid sector within the region, the persisting challenge of capital access for small local companies compared with large companies with international support, and the unaddressed gaps and needs of the types of investments required, and it reveals, through its discussion of capital access modes, why the existing capital access challenges are skewed towards small local companies.

5.2 Factors Favouring Kenya's Off-Grid Capital Access

Kenya successfully leveraged its financial digital innovation, high mobile ownership and SIM-card subscription to introduce and expand off-grid energy products to the newly '*banked*' populations. These populations comprise Kenyans who were not part of the official banking systems but are now incorporated in mobile money transfers (M-PESA). Baker termed this as '*banking the unbanked*' (Baker, 2023). Following the M-PESA's launch in 2007, the adult banked population increased from 48.9% to 75.3% between 2006 and 2016, and it currently processes more than half the country's GDP (Baker, 2023). In 2012, Safaricom – the innovator of M-PESA – partnered with a commercial bank to launch money-lending services to customers, a lucrative move that saw them partner with another bank for the same services three years later (Khusoko, 2020). Amid these innovations, M-KOPA was commercially launched in the same year, offering low-income households a '*distributed cost*' payment system – PAY-GO – that enabled the purchase of off-grid solar products and making small payments over an agreed period (Founder Africa, 2023). M-PESA lending services increased liquidity in the market, whereas M-KOPA leveraged the existing mobile financial innovation to improve affordability. This only continued to grow. In 2024, the Ministry of Energy

reported that Kenya had a phone penetration rate of 124.5% and an even higher SIM-card subscription due to multiple registrations (MOEP,2024).

Cognisant of its unique advantage, Kenya incorporated off-grid energy solutions in its 2018 KNES with an estimated carved-out market contribution to universal energy access (MOEP, 2018). When off-grid solar solutions were entering the mainstream of energy provision in the early 2010s, the sector benefitted from the existing liberalisation of the energy sector, and the idea of private sector participation was already an accepted norm or, at the very least, familiar in Kenya's energy market. Compared with the legal frameworks, the financial digital innovation of M-PESA was of even greater significance.

As a result of M-PESA and M-KOPA, Kenya became a trailblazer in the off-grid energy sector. Following the success of M-KOPA, other companies were established and penetrated the market to compete in selling off-grid solar products. Furthermore, the technology transfer and the concept of the PAY-GO system were adopted in other countries, or, most importantly, the successful companies in Kenya sought to expand their businesses to other countries. Despite this technology transfer, Kenya remained ahead of the curve and has been viewed by actors as the operational focal point of the sector, with many companies establishing their headquarters in Nairobi. The country maintained a vibrant sector engagement with key stakeholders, hosting multiple conferences and creating a clustering effect. This situation has helped off-grid companies operating in Kenya raise capital due to their proximity to investors. An impact investor corroborated this view and highlighted Kenya's pioneer advantage regionally.

"For a wide variety of reasons, Kenya became the epicentre of the industry. The history is kind of funny; part of it is maybe because M-Kopa became very big, and it started there. A lot of it, I think, is because of M-PESA and then just the penetration rate of mobile money, mostly M-PESA. Whatever it was, there's the sweet spot of like all the different pieces that make for a strong PAY-GO market that Kenya hit that nobody else quite did, even though, like a lot of companies that made forays worked really hard in Tanzania, it didn't quite take off the same way. So, I think some of that is just having a presence in Nairobi, strangely, because Nairobi is the regional finance centre of all those things, especially for this sector, and it just became the place to be. So, we actually found[ed] our first

*office was in Arusha, Tanzania. I still have two people on my team who are based in Arusha, but we moved our office around 2017/18 to Nairobi and **never looked back. At the same time, more people were opening their offices or holding big conferences, and everything was there. And some of that was, it wasn't so friendly in Tanzania at that time. Anymore! But also, there was a gravitational pull into Nairobi. Being there was very valuable, and the interactions were not elsewhere.***

(Arnold, Investment Director, Impact Investment Fund)

As a result of the interplay of these two pioneer systems and the actors' clustering effect, Kenya has stayed ahead of the curve in the off-grid sector in two areas: solar penetration rates and enabling investments. Regarding the former, the Kenya Bureau of Statistics (KNBS) reported in 2019 that 19.3% of the 12 million households used SHSs as the primary lighting source (KNBS, 2019). Soon, one out of five households in Kenya will use solar as a primary lighting source. Regarding the latter, an analysis of the GOGLA investment data between 2012 and 2022, illustrated in Figure 9, below, highlights that companies operating in Kenya, regardless of their expansion to other countries, received more financing in the off-grid sector compared with those operating in the neighbouring countries of Uganda and Tanzania.

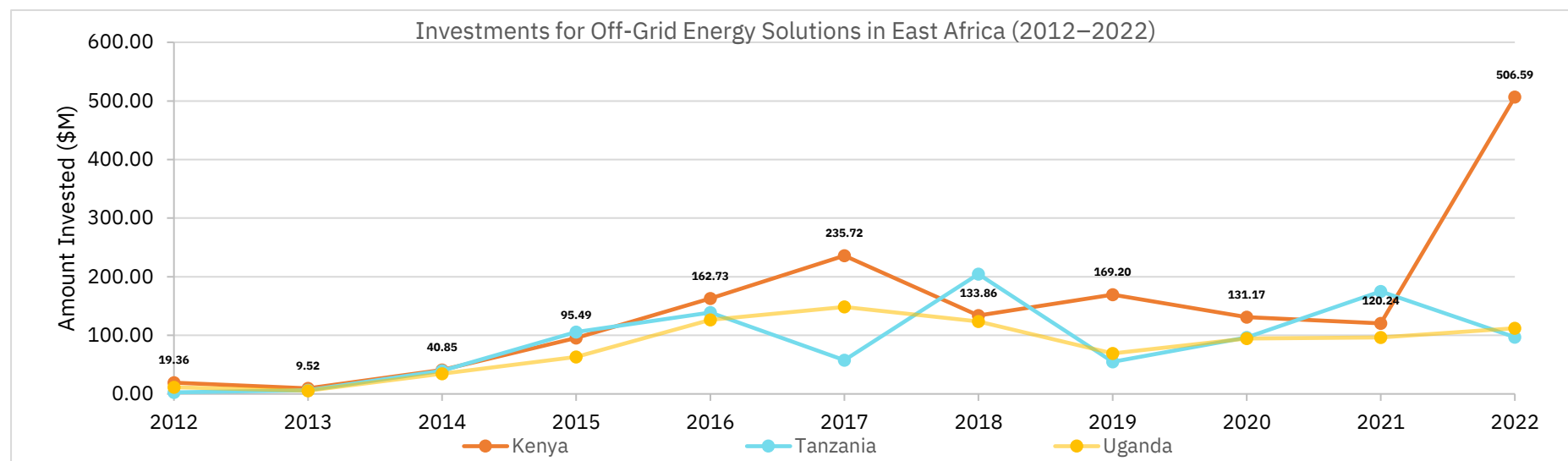


Figure 9: Investments for the Off-Grid Sector in East Africa (2012–2022)

Off-grid financing in these three East African countries has grown tremendously since the early 2010s, as highlighted by the (total volume) investment trends in Figure 9 above. Across the three countries, approximately US\$1.96 billion of publicly disclosed capital was invested in the off-grid sector. The cumulative (including the overlap of capital across the three countries) amount of investment that flowed to companies operating in the three countries was Kenya – US\$1624.73 million, Tanzania – US\$977.85 and Uganda – US\$895.80 million. These figures confirm that Kenya has significantly benefitted from raising capital to fund the off-grid energy access pathway documented in KNES. Further cementing the advantage Kenya held from the start, 82.83% of all the money invested in these three countries was to companies operating in Kenya, with 49.85% going to companies operating in Tanzania and 45.67% to those operating in Uganda.

In addition, Kenya's progress in the '*capital growth*' stage, discussed in the previous chapter, propelled private investments in the off-grid sector. The influx of public investors who invested to de-risk private capital is consistent with the role of public investors in 'financialised-centric' development financing (Mawdsley, 2018; Bougrea, 2024). Cumulative investment capital flow to these three countries was ~US\$3.5 billion, but in actual investment, only US\$1.96 billion was disbursed to the companies operating in these three countries, which indicates significant capital-sharing across the countries and highlights Kenya's role in technology transfer in the off-grid sector.

5.3 Capital Distribution and Sharing Across East Africa (Kenya, Tanzania and Uganda)

Capital-sharing in East African countries can only be studied through technology transfer and the spread of the PAY-GO system from Kenya to other countries. While new companies were established in countries other than Kenya, hoping to take advantage of the proven technology, the success achieved by those operating in Kenya sought to expand to new geographical areas. For these expanding companies, the financing benefits Kenya and the new countries (a case that may understate capital solely used in Kenya at the beginning and, at the same time, overstate the capital-sharing between Kenya and its neighbours). To analyse capital-sharing among the three countries, this research assumes the following: 1) A company operating in more than one country benefits from all the previous and current investments; hence, the point of expansion is not considered in capital-sharing. 2) The scope of this research is limited to the three countries to demonstrate technology transference, which initially spread to these neighbours due to proximity and close trading relations, among other factors. The scope does not include all the countries some companies operate in outside these three. 3) Hence, this research utilises Kenya, Uganda and Tanzania as a small case study to delimit the geographical investment universe. Nonetheless, to understand capital-sharing and distribution to avoid overstating the capital flow to the three countries, a disaggregation of the capital-sharing is required. A lingering question regarding capital distribution and sharing is, despite Kenya's advantage, does the country have a sole advantage?

Despite significant capital-sharing across the three countries resulting from companies operating in multiple countries, a large portion of capital was invested in companies without a presence in Tanzania and Uganda. Out of the US\$1.96 billion invested, 45.59% was shared in different combinations in the three countries. The breakdown of the capital-sharing of the total investment at the country level is as follows: Kenya, Tanzania and Uganda shared 32.76%; Tanzania and Uganda shared 0.12%; Kenya and Uganda shared 12.44%; and Kenya and Tanzania shared 0.27%. Hence, 54.41% of the investments were not shared and went to companies operating exclusively in one of the three countries. For investments made solely to companies operating in only one of the three countries, Kenya had 37.36% (US\$732.8M), Uganda 0.34% (US\$6.8M) and Tanzania 16.70% (US\$327.6M) of the total investments. Figure 10, below, illustrates the capital-sharing across the three countries. Kenya had by far the highest amount of capital invested in companies without an operational presence in Tanzania or Uganda. Uganda and Tanzania received fewer investments than Kenya, but they shared a significant portion of their investments with Kenya. This finding indicates that Kenya relied less on investments made to companies operational in other countries. In contrast, Uganda was highly reliant, sharing ~99% of its received investments with other countries. Similarly, Tanzania shared two-thirds of its investments with companies operational in Kenya. In contrast to Kenya, 45.10% of the total investments made to the country were not shared with other countries. These figures provide further evidence of the influence of Kenya's pioneer advantage, the advantage of stakeholder clustering in Nairobi, the epicentre advantage of both technology transfer and company expansion, and its regional role in off-grid adoption in the East Africa region.

As highlighted previously, the findings of the regional analysis of the three countries indicate that Kenya has a capital access advantage for being a '*regional finance centre*' for the off-grid sector and the '*epicentre*' of stakeholder engagement. The proximity to capital resources and the vibrant stakeholder engagement give companies operating in Kenya an advantage in accessing capital. Surprisingly, the capital share between Kenya and Uganda proves that most companies operating in Uganda may have originated in Kenya and expanded to Uganda.

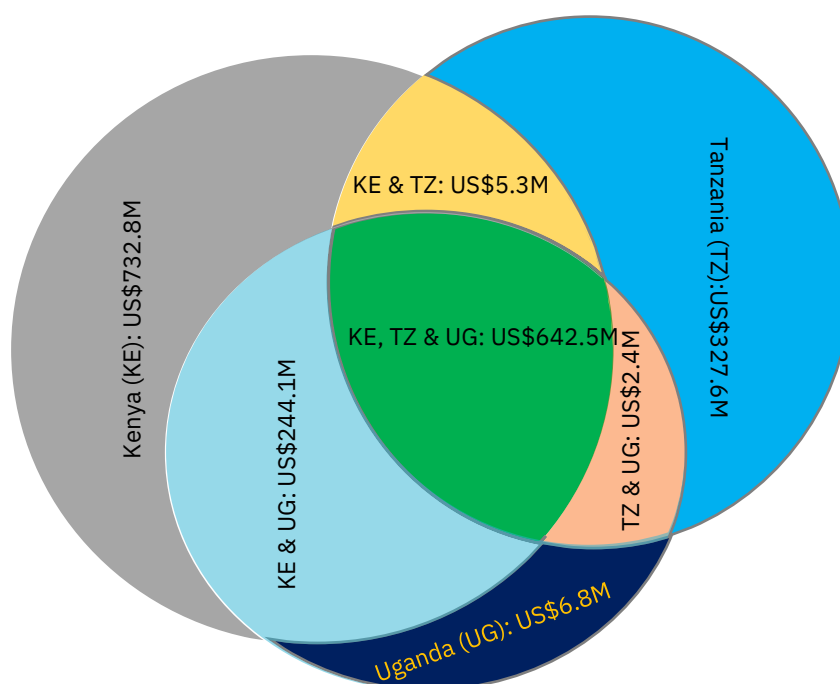


Figure 10: Investment Flow, Distribution and Sharing in the Off-Grid Sector across Kenya, Tanzania and Uganda

Beyond these three countries, and outside the geographical investment scope delimiting this regional case study, it is also possible that some of the capital highlighted as exclusively used in one of these countries was also shared by more countries in SSA. The findings in this section highlight that, as a pioneer country, Kenya has benefitted from attracting investors and related stakeholders for the off-grid sector. This clustering effect has encouraged vibrant sector engagement, which has resulted in companies operating in the country having more access to capital resources due to proximity compared with its neighbours. Kenya's growth in the use of SHS reflects the country's investment advantage. In 2009, 1.62% of Kenya's population used SHS as a primary lighting source, compared with 19.3% in 2019 (KNBS, 2009; KNBS, 2019). Altogether, including the investment advantage, the sector's growth is attributable to national strategy documents that carved out the role of SHS, favourable legislation and tax subsidies (MOEP, 2018).

Having established the advantage that companies operating in Kenya have, the following section focuses on a company-level analysis of off-grid companies in Kenya. The section reviews the capital distribution among off-grid companies to understand the patterns of capital access. First, the section focuses on Kenya to understand investment actors: investors

and investees. Second, it addresses the latter part of the first research question, which focuses on how investment actors invest.

5.4 The Dominance of a Few International Companies in Capital Access

This section analyses off-grid investment flows in Kenya, focusing on the actors: investors and investees. Regarding investees, the following are considered: the amount of investment received, the frequency of investment deals, the number of investors in each company, and investor relational leverage and commitment. Although this section finds that Kenya has many off-grid energy companies and has attracted many investors to provide capital to companies operating in the country, it argues that only a few large and international companies access most of the capital. This research also finds that some companies have leveraged their investor relationships, enabling repetitive follow-on investments from the same investors. The number of investors and the frequency of investment deals indicate the investors' attractiveness to these companies based on the industry's prevailing investment decision-making criteria. Consequently, it is unsurprising that some companies have successfully raised capital while others continue to struggle.

Although Kenya has a large number of off-grid-related companies, the number of investors providing capital to these companies is even more remarkable. The US\$1.625 billion invested in the sector was channelled to 38 companies by 95 investors. Hence, the ratio of off-grid energy companies to that of investors is 1:2.5. While it might seem that each company received investments from 2.5 investors, in reality, only five companies received 83.57% of the investments between 2012 and 2022. These companies were Greenlight Planet–27.30%, d. light–23.44%, BBOXX–11.78%; M-KOPA–11.04%, and Engie Energy Access–10.01%. Table 10, below, is a company level breakdown of the amount of investment received, the percentage of the received investment relative to the country's total investment, the number of investment deals, and the number of investors and (if any) follow-on investments.

An investor analysis of the capital provision for off-grid companies revealed an investment clustering effect. Figure 11, below, illustrates this investment clustering to the top five

companies, with some investors investing in multiple top five companies. For example, one investor, GSMA Mobile for Development Utilities, invested in four of the top five companies: d.light, Engie Energy Access, Greenlight Planet and M-KOPA. One interviewee corroborated these findings by highlighting the following:

“I think we have a few that are taking on upwards of 80% of the financing going in the sector. So, you have some companies that have really taken off and are raising, you know, multiple millions, up to 100 million in the case of a few. And I think it’s been exciting for some of that consolidation to happen because it’s happened across multiple business model types, which is exciting for the sector. But those businesses are a bit more of the unicorns, whereas a lot of the businesses are still struggling to scale or to become profitable.”

(Lea, Director of Country Transition, Industry Association)

This research also explores the nuances of capital provision to illustrate supremacy and subordination in capital access. To achieve this aim, the research conducted a company level analysis of the number of deals and investors, as well as subsequent investments, factors that are significant for understanding investor–investee engagement. Notably, companies that received the highest amount of investments led regarding the number of investment deals from multiple investors. At the top of the list are BBOX and d.light, with 40 and 30 investment deals, respectively. These companies not only have a higher frequency of investments or deal turnover factors but have also attracted many investors and, most importantly, received multiple investments from the same investors. BBOX and d.light each have 22 investors that have channelled funds to their companies, with some investing in the company numerous times. Although all the top five companies received follow-on investments from at least one investor, it stands out that four of the top five companies received these follow-on investments from numerous investors. Table 10 details these factors for all the off-grid energy companies in Kenya. This research brands the top five companies as dominant and the rest as subordinate.

Table 10: Proportion of total investments received by off-grid companies

	#	Off-grid Company	Amount of Investment (\$)	% of the total Investment	Sum of %	No. of Deals	No. of Investors	Comments
=>10% of the off-grid investments	1	Greenlight Planet	443,607,462.65	27.303%	27.303%	27	12	2 investors have financed the company multiple times. Trine has invested 15 times in the company
	2	d.light	380,841,698.53	23.440%	50.744%	30	22	5 investors have financed the company more than once.
	3	BBOXX	191,397,318.37	11.780%	62.524%	40	22	7 investors have financed the company more than once. Energise Africa (a JV between LH and Ethex) and Trine have invested multiple times, 7 and 5, respectively.
	4	M-KOPA SOLAR Kenya Ltd	179,344,666.41	11.038%	73.562%	21	18	1 investor (LTG group has invested more than once - 4 times
	5	Engie Energy Access	162,631,373.62	10.010%	83.572%	24	16	5 investors has financed the company more than once
>0.5%<10% of the off-grid investment	6	Azuri Technologies	57,664,871.30	3.549%	87.121%	22	10	2 Investors have financed the company more than once. One of which, Energise Africa (a JV between LH and Ethex) has invested 12 times
	7	SolarNow	40,638,159.11	2.501%	89.622%	17	7	3 Investors have financed the company more than once. Lendahand has financed the company 7 times
	8	Biolite	33,336,200.00	2.052%	91.674%	14	7	5 investors have financed the company more than once. Rose Park has financed the company 4 times
	9	Angaza	30,600,000.00	1.883%	93.558%	5	4	1 investor has financed the company more than once.
	10	SunCulture	26,500,000.00	1.631%	95.189%	4	4	No multiple investments from the investors
	11	Solar Panda	11,750,000.00	0.723%	95.912%	1	1	No multiple investments from the investor
	12	Nithio	11,500,000.00	0.708%	96.620%	2	2	No multiple investments from the investors
	13	Orb Energy	11,313,000.00	0.696%	97.316%	9	8	1 investor has financed the company more than once.
	14	Barefoot Power	9,311,261.10	0.573%	97.889%	4	3	1 investor has financed the company more than once
	15	Pawame	5,563,234.18	0.342%	98.231%	14	6	3 Investors have financed the company more than once. Trine has financed the company 7 times
<0.5% of the off-grid investments	16	Little Sun	5,294,000.00	0.326%	98.557%	2	2	No multiple investments from the investors
	17	Sunspot energy	4,200,000.00	0.259%	98.816%	1	1	No multiple investments from the investor
	18	Frontier Markets	3,392,270.88	0.209%	99.025%	5	4	1 investor has financed the company more than once
	19	Amped Innovation	3,300,000.00	0.203%	99.228%	1	1	No multiple investments from the investor
	20	Sollatek Electronics Kenya	2,993,929.69	0.184%	99.412%	21	2	Both investors have financed the company multiple times. Energise Africa (a JV between LH and Ethex) has financed 13 times
	21	Koolboks	2,666,519.75	0.164%	99.576%	6	6	No multiple investments from the investors
	22	EcoEnergy	1,520,103.53	0.094%	99.670%	3	3	No multiple investments from the investors
	23	Raj Ushanga House (Azuri)	1,312,822.00	0.081%	99.750%	5	3	1 investor has financed the company more than once. Trine has financed 3 times
	24	Agsol	881,261.44	0.054%	99.805%	1	1	No multiple investments from the investor
	25	EcoZoom	797,618.49	0.049%	99.854%	4	2	1 investor has financed the company more than once. Trine has financed 3 times
	26	Mwezi	500,000.00	0.031%	99.885%	1	1	No multiple investments from the investor
	27	Micro Energy Credits	419,668.08	0.026%	99.910%	1	1	No multiple investments from the investor
	28	SunTransfer Kenya Ltd	350,000.00	0.022%	99.932%	1	1	No multiple investments from the investor
	29	SolarGen Technologies Limited	250,000.00	0.015%	99.947%	1	1	No multiple investments from the investor
	30	Brighterlite	246,100.38	0.015%	99.962%	1	1	No multiple investments from the investor
	31	Bidhaa Sasa	194,289.23	0.012%	99.974%	1	1	No multiple investments from the investor
	32	NewLight Africa (Heya!)	93,443.05	0.006%	99.980%	1	1	No multiple investments from the investor
	33	Intasave Energy	88,552.00	0.005%	99.986%	1	1	No multiple investments from the investor
	34	Deevabits Green Energy	50,000.00	0.003%	99.989%	1	1	No multiple investments from the investor
	35	Mibawa Suppliers Ltd.	50,000.00	0.003%	99.992%	1	1	No multiple investments from the investor
	36	SolarFreeze	50,000.00	0.003%	99.995%	1	1	No multiple investments from the investor
	37	SunnyIrrigation	50,000.00	0.003%	99.998%	1	1	No multiple investments from the investor
	38	RVE.Sol	33,207.00	0.002%	100.000%	1	1	No multiple investments from the investor

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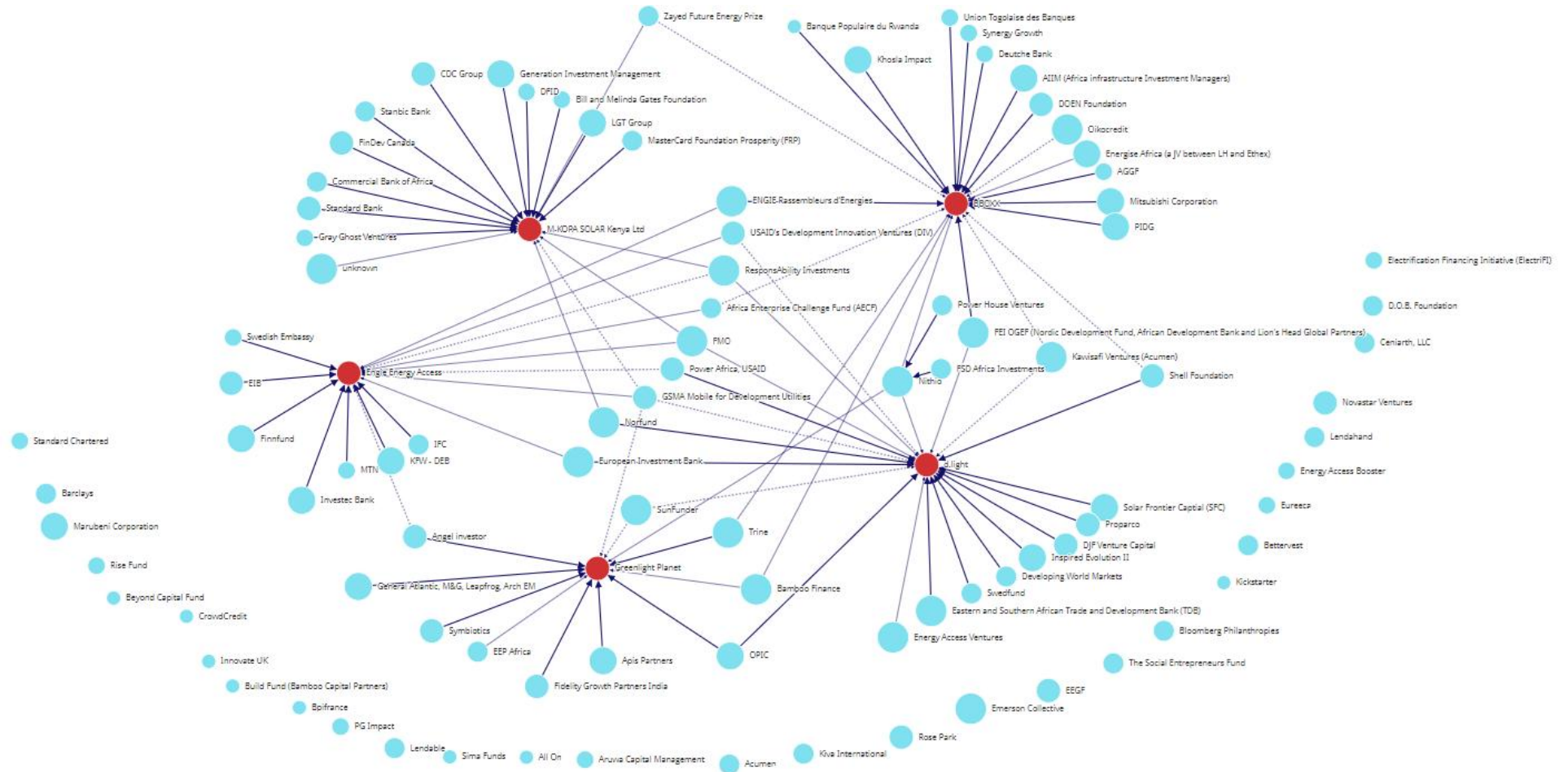


Figure 11: Stakeholder Map - Scale-Up Stage of Companies' Funding Flow

On the one hand, it helps to understand, from an investor's perspective, companies that meet multiple investors' decision-making criteria. The number of deals indicates investor engagement and interest, as evidenced by the frequency of capital flows to off-grid energy companies. The follow-on investment highlights the magnitude of investor commitment to growing/supporting these companies and their responsiveness to the ever-changing needs of these companies. The importance of subsequent or follow-on investments is distinct because it has a unique implication separate from that of securing a first investment from an investor. Follow-on investments are leveraged from an existing and possibly ongoing relationship, resulting in frequent interaction and engagement between the investor and the investee. This ongoing relationship provides the existing investor with an insider's perspective on a company that has already passed comprehensive due diligence to secure its initial investment. Hence, the follow-on investment rate is an even more powerful indicator of investment appeal due to reduced information asymmetry between the existing investor and the investee. This factor is a potent signal to a prospective investor of a company's investment appeal. On the other hand, it reveals companies that meet normative and de facto investor industry criteria, highlighting the attractiveness of these companies to investors and their ability to leverage existing investment relationships to raise additional financing. Although this ability obviously seems to cut through the top five leading companies, outside of this group, others stood out for the same reason, although overwhelmingly, the majority struggled.

Most of the subordinate off-grid energy companies received meagre capital; half received investments from a single investor, and only a few secured subsequent follow-on investments – approximately half (52%) of the non-dominant companies secured one-time investment from one investor. Additionally, 66.67% of this group of companies did not receive follow-on investment. The difference between these figures (15.15%) is the companies that secured single investment deals from multiple investors, but none included subsequent investment from existing investors. These figures indicate that this group of companies has a low investment appeal to investors, further demonstrated by their low relational leverage to secure subsequent investments. Regardless, some companies still excelled in this group. For example, Sollatek Electronics Kenya, which only received 0.184% of the country's total

investment, secured 21 investment deals from only two investors. Hence, this company has the highest investor relational leverage ratio of any company, indicating that although the company received many small investments from two investors, it was able to leverage its few existing relationships to raise multiple subsequent investments. The two investors displayed tremendous commitment to the company's growth and responded to its needs.

Although Sollatek Electronics Kenya is not an isolated case in this group, it is a rarity, and the majority of the companies struggled to meet the investment decision-making criteria. Even worse, many companies struggled to leverage their existing investment relationship for subsequent investments. Therefore, only a few companies have the corporate capacity, resources and strategies to meet multiple investors' de facto investment criteria. As a result, the investment clustering effect occurs, and the majority of investors channel their resources to a few companies. The results support this view by revealing that 63.16% of the 38 companies cumulatively received 2.11% of all the investments. What stands out from the clustering effect of investments is the dominance of a few companies that raise large sums of investment from multiple investors and the sheer struggle of ~57.89% of companies in raising finances. Thus, the tale of raising finance for the off-grid sector in Kenya differs depending on the company. For a few, it is a tale of success; for many, it is a tale of tremendous struggle and failure. Having determined in this section that investment clustering attracts investment to a few companies, the following section investigates whether the size of the company influences capital access.

5.5 Company Size Analysis Regarding Capital Access

5.5.1 The Struggle of Seed and Start-Up Companies to Access Capital

This section analyses the off-grid investment flows in Kenya, with a central focus on company size/stage. This section investigates two key factors: the relationship between company size and access to capital and the type of capital prevalent in companies at different stages. The findings indicate that, although most companies are at the seed and start-up stages, they receive a small portion of the sector investments. These findings corroborate those from Section 5.4, since the dominant top five companies are all categorised as scale-ups. The research also found that the three company stages had different capital structure combinations.

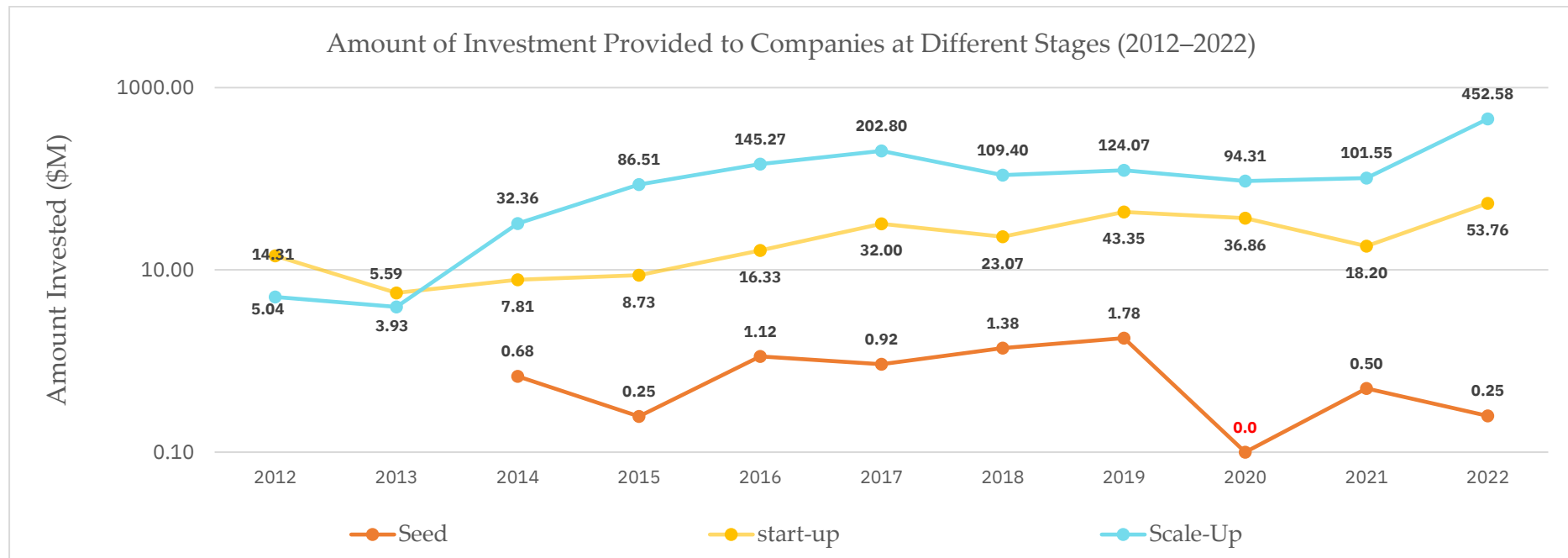


Figure 12: Amount of Investment Provided to Companies at Different Stages (2012–2022)

In a decade, the cumulative investment amount that flowed to companies in Kenya was consistently commensurate with company size. Figure 12 illustrates three levels of company stages: the seed stage at the bottom, start-up in the middle and scale-up at the top, which are proportional to the amount of investments. The figure also provides a general overview of how financing has changed for companies at different stages over the years.

Within the off-grid investment ecosystem, company stages are categorised based on the company's valuation. The GOGLA dataset categorises company size as seed/start-up (US\$0–100 million, Pre-series A to Series C) and scale-up (above US\$100 million, Series D and above).²⁸ The data reveal that only 13.16% of the 38 companies are at the scale-up stage, 44.74% at the seed stage and 42.11% at the start-up stage. The key deduction from Figure 12 is that although large companies are expected to absorb large amounts of capital relative to small companies, given the proportion of companies at each stage, companies at the seed and start-up stages struggle to raise the needed capital. However, this deduction cannot inform the causality of this struggle; it neither explains whether redistributive approaches that could divert some of the capital flows from scale-up companies to small companies would bridge this capital access gap given the complexity of investor mandates and investment criteria, nor whether there is a general sectoral capital deficiency experienced even by those that currently access large amounts of investment. Beyond this overall trend, a detailed breakdown paints a more nuanced picture.

The addition of the size factor in this section supplements the discussion in section 5.4, which identified a few companies' dominance of capital access. It is not just a few companies that access financing, but **a few large international companies** with access to most of the capital. An international company is one registered outside Kenya, even though its headquarters and core operations may be based in the country. GOGLA reports the industry has seven companies at the scale-up stage, and their investment trend is distinct from the rest in the sector²⁹ (GOGLA, 2022). Specifically regarding Kenya, this research revealed that all the top five dominant companies were at the scale-up stage. Consistent with the earlier findings, this

²⁸ <https://www.gogla.org/investments-in-the-off-grid-solar-sector-grow-by-44-to-hit-a-record-450m-in-2021/>

²⁹ <https://www.gogla.org/investments-in-the-off-grid-solar-sector-grow-by-44-to-hit-a-record-450m-in-2021/>

information indicated that 83.57% of Kenya's entire investments went to scale-up stage companies (large companies). The seed and start-up companies received 0.42% and 16.00%, respectively. Figure 12 illustrates this finding; it employs a logarithmic scale to make seed stage investments visible and reveals a consistent trend of companies at the seed stage receiving less financing relative to start-ups and scale-up companies. Similarly, start-ups received less funding than scale-up companies, except for 2012, when start-ups received US\$14.31 million compared with US\$5.04 million to scale-up companies. In addition to the amount of funding attracted at different stages, the type of financing differs for the three company stages.

5.5.2 Company Size and Type of Finance

Companies at different stages attract different types of funding contingent on their capital needs, resources and availability. This subsection focuses on how companies attract different types of capital at various stages. There are two analysis levels to understand this subject: access and capital composition. The former analyses what percentage of the sector's overall financing type (grants, debt and equity) reaches different company stage classifications (seed, start-up and scale-up). The latter analyses the composition of capital types at each lifecycle stage. The access factor is a second-order analysis level that further disaggregates the amount of funding channelled to different company size categories via the types of financial instruments. Similarly, the composition factor provides an in-depth understanding of how each category is funded and the distinction that exists among the three groups.

Table 11: Types of Capital Accessed by Off-Grid Companies at Different Lifecycle Stages

Company Life Cycle/Size	Seed			Start-up			Scale-up			
Type of Capital	Amount (US\$)	Access Factor (%)	Composition Factor (%)	Amount (US\$)	Access Factor (%)	Composition Factor (%)	Amount (US\$)	Access Factor (%)	Composition Factor (%)	Total (US\$)
Debt	4,420,858.76	0.66%	64.19%	89,792,831.23	13.36%	34.53%	578,083,363.93	85.99%	43%	672,297,053.91
Equity		0.00%	0.00%	161,605,990.00	17.75%	62.15%	748,669,918.55	82.25%	55%	910,275,908.55
Grant	2,466,206.44	5.85%	35.81%	8,624,624.79	20.46%	3.32%	31,069,237.11	73.69%	2%	42,160,068.34
Total	6,887,065			260,023,446			1,357,822,520			1,624,733,031
% total financing accessed	0.42%			16.00%			83.57%			

The company size and type of finance analysis results indicate the following: 1) consistent with the scale-up companies' dominance to capital access in the off-grid sector in Kenya, the results reveal they accessed the majority (>70%) of funds across all three capital types, although their key funding mainly consisted of equity (43%) and debt (55%) financing. 2) Having accessed 0.42% of capital in the sector, seed stage companies had no success raising equity finance, with almost two-thirds (64.19%) of their finance coming from the 0.66% of the debt capital accessed and marginally over one-third (35.81%) of their finance coming from 5.85% of the sector's grants. 3) Having secured 16% of the sector's

financing, start-ups accessed considerable (>10%) funds across all three capital types, although their funding significantly consisted of equity (62.15%) and debt (34.53%). Overall, debt played a significant funding role at each stage; debt comprised more than one-third of the funding for all three groups. Furthermore, although equity financing was the leading type of capital for scale-up and start-up lifecycles, seed stage companies raised no equity. Hence, seed stage companies relied heavily on grant financing compared with the other groups. This finding also implies that investors are averse to providing equity financing to seed stage companies. Seed stage companies have accessed only a meagre portion of the sector's grant financing and a negligible amount of the sector's debt financing, providing further evidence of the dominance and subordinate nature of the energy companies, highlighting a prevailing capital access gap, especially regarding grant financing.

Seed and start-up companies are often privately owned, financed by owners' funds and short-term borrowing, and tend to seek private financing (Brotzge et al., 2011). This is because although the financing needs are high, many have no assets to offer as collateral at this stage. Seed stage companies work to prove their market traction and build a customer base, often piloting their products in the markets. As a result, they can only rely on debt, as their business is deemed too risky to absorb equity from venture or private equity firms, which explains the lack of equity in the seed stage companies discussed above. Higher levels of the business lifecycle include expanding,³⁰ high-growth³¹ and mature companies.³² Start-ups and scale-up companies considered expanding or high-growth companies with proven market traction, having piloted and acquired a customer base, can secure equity and (long-term or short-term) debt (Brotzge et al., 2011).

Seed stage companies have the highest debt in their fund composition relative to scale-up and start-up companies, creating a sustainability concern for such financing at an early stage.

³⁰ Expanding companies – companies with proven market traction and customer base. Financed by private equity and/or venture capital, owner's equity and debt. They tend to have low leverage and more short-term debt than long-term debt Brotzge, L., Wyss, D., Fabozzi, F.J., Armitage, S. and Torre, A.d.I. (2011). "Financing and raising capital".

³¹ Moderately leveraged companies with high-growing revenues and established market traction. They issue equity in common stocks, warrants or hybrid securities, such as convertible notes. Ibid.

³² These are relatively highly leveraged and are likely to exit the market through an IPO. Ibid.

More borrowing at such an early stage may limit future capital-raising due to reduced collateral. Funding for early-stage companies often comprises “sweat equity”, owners’ cash, finances from family and friends, and short-term borrowing from banks, often against the owner’s personal assets or the business’s borrowing capacity (Brotzge et al., 2011). Given that the top five companies are large and international, many small- or medium-sized companies are local, as confirmed by one investor who stated the following:

*“So, one is just, you know, the nature of this shortage of capital in the sector. So, we see that there’s a lack of debt, equity and grant capital for small- and medium-sized distribution companies. Why does that matter? **Small and medium distribution companies, they’re more likely to be locally led.** (...) **We also see them serving communities that some of the large, vertically integrated solar manufacturers are not reaching.** So, they might be operating in more rural areas. They might be operating in more high-risk countries. **We just see them beyond the footprint of kind of the dominant solar off-grid solar companies. They also can serve different niche markets within even more heavily saturated markets.**”*

(Miles, Director, Investment firm & Fintech company)

Hence, large international companies are comfortable contacting international investors for financing, whereas small local companies still rely heavily on local networks and prefer traditional funding, such as debt. One venture capitalist stated the following:

*“We’re conscious that local businesses are still accessing their own local networks for finance and using, for lack of a better word, family and friends, you know, tribal type networks, extended family type networks to access capital. And that’s really important, and that’s all well and good and part of the ecosystem. I guess what we want to be sure of is that if they are trying to get **international** venture capital, there are no undue barriers to them doing that. And I think access to sort of more international grant and early-stage capital is really critical here.”*

(Andrew, Managing Director, Venture Capital Firm)

Local entrepreneurs are also more inclined to use traditional financing of debt as opposed to equity financing, which explains why equity financing is zero at the seed stage from the international investors, since many may prefer to obtain traditional financing debt from local

banks, albeit expensive. Although some private equity firms offer small tickets³³ of equity financing to start-ups, they have received feedback and observed that, in Kenya, many of these companies prefer debt.

“We have the inclination to do equity or equity-like instruments, like convertible notes. We understand the legal frameworks, and they are much more defined and easier to navigate. Nevertheless, we also appreciate that, since we are targeting local entrepreneurs a bit more, they might not be familiar with this, and some of them may prefer the more traditional funding approaches, such as debt. And we are at the moment exploring how we can support such. This is because we are increasingly getting feedback, and we would be more than willing to assist because our intention is really to grow that space.”

(Garry, Investment Officer, Private Equity)

This explains, to some extent, why financing for seed and start-ups is still very low, given their reliance on local finance networks, but some also prefer traditional funding approaches. Furthermore, this approach partly explains why the data revealed that seed stage companies did not have equity financing, and the majority had almost two-thirds of their financing from debt. Regardless, small companies need more financing and additional support to help understand their target market, conduct market research to understand the niche or their targeted clientele, and need to research the development of their products. Small companies struggle to raise grant financing due to the fierce competition from large companies and hegemony reinforcement practices. Thus, there is a need for exclusively targeted financing for small companies. One interviewee from one of the top five scale-up companies echoed this fierce competition.

“Currently, for ‘Kampuni’ at this level, they have that ability to approach an investor. When you’re approaching an investor, there are those things they look at, for example, basic documents like a certificate of registration, tax compliance company details, or even look at your financial details. They check to review your capacity to handle a certain amount of money or even your past experience in terms of implementing similar projects. So, basically, a company like ‘Kampuni’ sells itself at this level,

³³ Small tickets means offering a provision to invest in smaller amounts than those that would otherwise be provided to a large company.

even at times, it doesn't pitch so hard. But if it's a start-up, in my opinion, it is way more difficult to get this kind of financing because, first of all, you have done minimal work, and you may lack the structure and infrastructure in place to implement any kind of project. So, basically, it's like what we say in employment: you're hired with no experience, which means you have to show outstanding potential. So, in general, 'Kampuni' is better placed because it is well established, and even in terms of competition, I can say that in Kenya, we have three main competitors. So, you see, you are competing with only about three companies. So, if a small organisation wants to try to compete with us in a similar grant, most likely they won't get it."

(Edward, Impact Manager, [Scale-Up Stage] Solar Off-Grid Company)

To understand hegemony in grant capital access, the access factors calculated in Table 5 are directly proportional to the access factor for equity financing. In other words, those who received more equity financing received more grant financing and vice versa. This situation leads to the conclusion that access to grant financing is often tied to commercial funding, and although some financing includes grant funds available to all companies, many are restricted, only available to those whose investors have invested commercially, for example, with an equity stake in the company. Hence, if you access commercial financing, your chances of receiving catalytic funding are higher. One investor, Patricia, confirmed this situation and highlighted that they offer grants to their investees throughout their investment.

"We identify their needs during due diligence or when you're just talking to them. We visit them and look at their systems and what they have. Also, they can point out to us what their priority is and what they would want us to support them with. And then we can even just agree on it. And then it's a matching grant with 50% split, so they can have a buy-in because we cannot give them free money. Do we give them free money? No, no, no. So, we can give them up to three hundred and fifty thousand euros over the life of the investment."

(Patricia, Investment Officer, DFI)

In addition to this competition and hegemony, grant financing became rarer across the two

stages in the later years of the tracked decade (first stage: 2012–2016; second stage: 2017–2022). Figure 13, below, illustrates that, almost consistently for the first half of the decade (2012–2016), companies at all stages accessed grants. In the second half, however, the amount was reduced, and most was absorbed by scale-up stage companies, whereas seed companies absorbed more debt. Given the competition and the grant financing trend over the years, small companies and local companies may increasingly be starved of the financing needed to demonstrate proof of concept and achieve early customer acquisition. This lack may lead to many companies failing at the seed stage, further exacerbating investment clustering for the large companies. Such clustering also contracts the investment universe of the sector, limiting the number of investable companies in the future. One venture capitalist bemoaned this situation: *“I just wish there was a richer pool of investees to work with and some companies we haven’t invested in because we’ve just felt the entrepreneurs were asking too high valuations, which is normal in the market.”*

(Andrew, Managing Director, Venture Capital Firm)

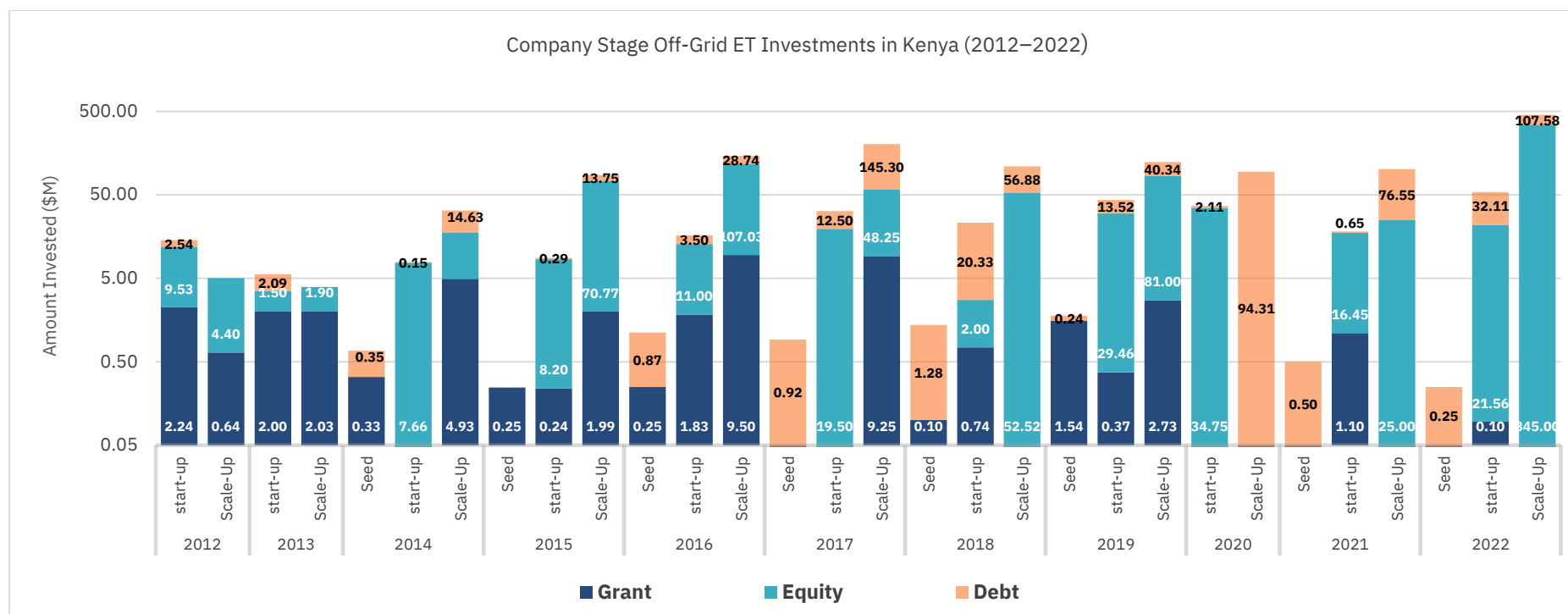


Figure 13: Type of Financing Provided to Companies at Different Stages (2012–2022)

This section examined two key factors: 1) the relationship between company size and access to capital, and 2) company size and the type of capital accessed. The research found that large companies accessed capital, whereas small companies continued to struggle. Companies at the seed stage struggled to raise equity financing, and most direly, they faced intense competition in raising grant financing, which they rely heavily on. Additionally, the low records for seed stage funding are partly attributed to their reliance on local financing networks to access

traditional financing debt. Although it is improbable that none of the seed stage companies pursued access to equity financing, the finding that small companies, some of which are local, still have a strong inclination and preference for traditional debt funding explains the lack of equity financing at this stage. Notably, the general trend highlighted that grants were becoming rarer. One of the interviewees echoed this point.

“I can quickly comment that equity, there’s just a lack of equity capital overall in this space, and that the vast majority of it has gone to the big off-grid solar companies that tend to be international and Western-based. There are also lots of small grant programmes, but they aren’t always enough to help early-stage companies reach a point where they can raise private capital.”

(Miles, Director, Investment firm & Fintech company)

What is worrying in the off-grid market in Kenya is that although the country has a vibrant market, it has an influx of investors whose mandate caters to a few. Although, in relative terms, this approach may seem like starving off capital to small companies, that may not be the case. The big companies' capital needs only grow with their expansion, and they will need to access capital from the existing venture capital, private equity, impact funds and DFIs. However, this research argues that one section of investors is not empowered, enabled or integrated as a fundamental part of the financing of the sector: “local financial networks”. This group of investors can play a key role in ensuring that small companies grow from the seed stage, gain market traction and access capital from large international funders. Having a few large companies also limits the investment universe for the investor. Although large companies have an investment appeal, it is imperative to grow small companies to broaden the investment universe and foster healthy competition. It is, therefore, vital that the sector ensures that, in totality, the type of financing provided is sufficient, reflective, and responsive to the needs of off-grid companies at different lifecycle stages. Although this section narrowly addressed the analysis of the types of finance regarding the size of the company in sub-section 5.5.2. The next section provides a broader sectoral and temporal analysis of the type of financing used to invest in off-grid energy companies, with an in-depth discussion on the role of different financial instruments to companies, their access and the gap that exists.

5.6 Financial Instruments Used to Finance Off-Grid Energy Access

5.6.1 Financial Instruments Used to Invest in Off-Grid Companies in Kenya

This section discusses the overall evolution of the sector regarding the type of finance provided, mainly by comparing the first half of the decade with the second half. The data record three main financing types: debt, equity and grants. This research found the following: equity financing consistently led over the years, more so in the beginning years relative to later years; debt financing increasingly became more common over the years; and although grant financing consistently only constituted a small portion of the sector's financing, this experienced a sharp decline in the later years.

More than half (56.03%) of the sector's financing came from equity. This is demonstrated in Figure 14 below, illustrating the frequent lead of equity financing. Only four of the tracked 11 years did debt financing surpass equity financing: 2017, 2018, 2020 and 2021. Strikingly, all in the second half period (2017-2022). At a sectoral level, equity constitutes most of the financing provided, at 56.03%, followed by debt at 41.38% and grants at 2.59%. This finding indicates that most of the provided finance was commercial, and a small portion was catalytic grant financing.

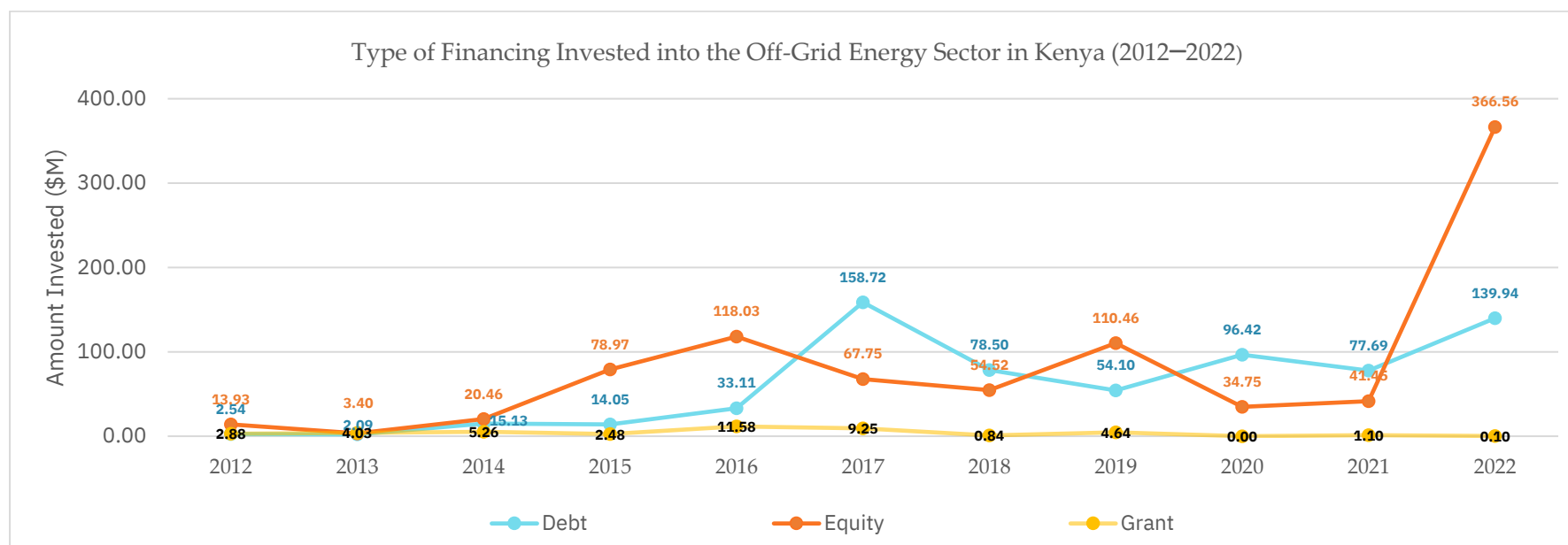


Figure 14: Type of Financing Invested into the Off-Grid Energy Sector in Kenya (2012–2022)

Although equity financing comprised the majority of the financing used to invest in off-grid energy companies, the gap between debt and equity is rapidly closing; a comparative analysis of the two halves of the tracked decade demonstrates this point best. In the first five years, 2012–2016, equity financing constituted 71.59% of the total financing, with debt at 20.41% and grants at 8.00%. Between 2017 and 2022, the proportion of financing changed to 52% for equity, 47% for debt and 1% for grants. The other important finding is the sharp decline in grant financing from 8% to 1.23%. Hence, the type of capital in the ecosystem continued to change, with debt provision growing fast and grant financing reducing

tremendously. This change is reflective of the off-grid sector in Kenya. Since the first PAY-GO company in 2012, with others following by using the same financial innovation to grow the SHS market, most of the pioneer off-grid companies were either at the seed or start-up stage and, therefore, required more grant financing compared with the later years, when the same companies grew to scale-up or growth stages.

Thus, the sector received an influx of grants relative to the total financing flowing into the sector to enable these companies to grow, prove their concept and gain market traction. As the companies grew from seed to start-up, equity financing dominated the sector. This situation explains why, in the first five years, grant financing comprised 8% of the sector, and high equity financing was 71.59%. Grant financing in the early stages is often non-repayable; it tends to finance broader knowledge, research, or sectoral aspects instead of being channelled to the company's operational activities, although sometimes it can. As the sector grew or the pioneer companies grew from start-ups to the growth stage or scale-up, their capacity for debt absorption also grew.

The portion of debt doubled marginally from the first half of the decade to the second. This research found that the proportion of debt financing increased from 20.41% to 46.68%, whereas equity financing decreased from 71.59% to 52.09%. Notably, companies accessed more debt financing in the last few years. Most (65%) of the sector's tracked funding was invested between 2018 and 2022. This change is attributable to the evolving financial needs of the companies and an influx of new and different financiers providing debt capital that entered the market in the later years. The number of debt providers increased by 146.67%, from 15 to 37, in the second half, growing more than double by welcoming new debt investors. Not only did the number of debt providers increase, but they also increased their frequency of investing in off-grid companies. Hence, the number of deals increased considerably, from 30 to 145, in these two periods. The vibrancy in the second half of the decade also coincided with the release of the KNES in Kenya, which more clearly highlighted the role of off-grid energy solutions in electrifying the nation (MOEP, 2018). KNES offered policy support for the

sector that may have boosted investor confidence, encouraging a further influx of capital providers.

There is a strong indication that off-grid companies in an emerging sector or market in a developing country will prioritise raising equity in the earlier years. Adding debt to the capital stack at the beginning may jeopardise a company's ability to scale up. Paying back debt reduces the final net earnings, reducing the company's earnings to finance growth opportunities. Grants, most of which are non-refundable, are scarce but beneficial to their recipients. Among other benefits, grants are useful in financing studies to understand new markets, finance technical assistance and advisory services, build capacity, and conduct research and development. Although capital investments increased in a decade, capital flows and access are still challenging to access for seed and start-up companies. Large scale-up companies have capital needs, too. Therefore, it is important to ensure that capital flow and access improve overall. Titus emphasised the peril of adding debt to a company at the beginning:

"So, we had 80 million of equity, which is a good foundation. It is good for us to reach that sort of scale on our equity basis, because scaling up is hard. If you add debt to the capital stack at the beginning, you might run into problems with project delivery or so on, which is harder with debt than with equity."

(Titus, Financer Officer, Distributed Electricity Utility)

This section found that, in Kenya, between 2012 and 2022, off-grid energy companies were financed mainly through equity and debt. Equity leads against debt, even though debt financing is growing quicker and closing the gap. Given that the data reveal that only a few large companies have received this financing, the research argues this general shift in the type of finance is due to the growth trajectory of pioneer companies who have grown from the seed stage to the scale-up stage. This situation is because start-ups raise equity capital to leverage debt to fund operations and growth. Hence, as companies grow, their demand for debt increases. The research also found that grant financing significantly shrank as a proportion of the total financing provided. This finding raises a significant concern regarding the future investment universe, since the majority (86.85%) of the companies still rely heavily on grants and lack the required

financing to achieve the milestones needed to attract commercial financing to support their growth. A lack of support for this group of companies to expand or venture into new and innovative areas will stagnate the country's financing, since large investors will find a lack of companies to invest in, since the off-grid sector already has more investors relative to investable companies. Although these three forms of financing are needed, they each play different roles or, at the very least, offer different benefits to companies. The next section explores the niche roles of different types of capital.

5.7 Roles of Different Capital Instruments

This section discusses the utility of different types of financial instruments. Although capital is normatively classified into three broad groups (debt, equity and grants), capital structuring is more complex than those classifications in practice. Furthermore, additional financial instruments, such as bonds, guarantees and carbon financing, are increasingly used to finance companies. The research highlights actors' perspectives on the utility and role of equity, debt, grants and guarantees, in that order.

5.7.1 Equity Financing

This section discusses the niche utility and role of equity financing by highlighting that, although many off-grid companies desire equity financing, they resort to more available debt capital. The research also found that although equity capital is rarely considered catalytic relative to other financial instruments, such as guarantees and grants, companies that accessed equity financing leveraged this to access additional funding, such as debt, to finance their operations (The World Bank Group et al., 2015). Furthermore, companies that accessed equity received greater value from their investors than the money invested: they benefitted from the investor's industry experience and networks, which helped them unlock other funding opportunities in the sector. Equity investors also contributed to the growth of companies by providing advisory assistance on some broader issues, such as corporate oversight, hiring senior corporate managers, and other consequential issues for the company. Due to equity providers' long-term commitment and care for the growth of their companies, they invest more of their resources in such companies, with some offering technical

assistance.

Companies and project developers expressed that equity financing is scarce. Although this view seems contradictory to the general quantitative analysis that identified equity as the leading finance, it also revealed that seed stage companies received no equity financing. Hence, this type of financing, for almost half of the off-grid companies, is desirable yet inaccessible. Small companies rely heavily on grants, especially in the absence of equity financing, which continues to diminish. The results of the qualitative analysis confirm a gradual reduction in grants. This finding corroborates the quantitative data that indicates grant reductions from 8% to 1.23% from the first half to the second half of the 2012–2022 decade. A director of one of the industry associations in Kenya and across SSA highlighted this point by stating the following:

*“I think companies lean into what is available versus what they want. I think one of the big challenges we have seen in solar space as well is **that equity is absent**. And I think most companies are growing through debt or through carbon finance presently, and some grants, but again, there’s a **reduction in grants over time**. But then there are challenges with **accessing equity**. So, I think equity is sort of a lost conversation for most of the subsectors So, you see companies growing through quite a bit of debt and servicing that debt. But again, equity is the one that’s really been missing.”*

(Lea, Director of Country Transitions, Industry Association)

The research found that equity financing was useful to off-grid energy companies in enabling them to raise additional funding. One of the managing directors of a venture capital firm specialising in equity financing to climate-related and energy companies stated it was easier for companies to raise debt and equity financing after receiving equity financing. Hence, companies leveraged their equity finance to obtain debt financing or equity investments from other investors.

“Because equity is the most risky thing, it is the most impactful thing. If you, as a company, have equity, you can go out and use the equity to leverage debt. And in our fund, we’ve got great statistics for every dollar we’ve invested. Our companies have been able to multiply that dollar by 10 in terms of other equity, and that’s all that’s coming. So,

equity has been a key factor."

(Andrew, Managing Director, Venture Capital Firm)

Equity financing offers more than financial investment: it provides an entry into an investor's network and its benefits. As part of the investment, some equity investors require a seat on the board of directors; hence, they have one of their team members as a board member. This board participation not only offers oversight of the company's corporate governance but also benefits the company through the investor's experience and expertise. This advantage gives the companies a competitive edge due to the advisory and technical assistance they receive.

"The other reason why we prefer equity is that you have a voice in helping the company navigate in the right direction. We don't command or instruct them to take a certain trajectory, but given our industry experience and what we can see as professionals, we make proposals that are sound enough to the company as to how they can progress as they grow. This is part of our work as equity investors. We also, as part of our technical assistance, sometimes introduce these companies' management to coaches and those kinds of resources, so that they can learn from the best in the industry as well. So, it's not just the direct input we can provide; in other areas where we feel like they need additional support, we are also open to helping them."

(Garry, Investment Officer, Private Equity Firm)

Ultimately, by providing equity financing and by the nature of the long position held by these investors, they naturally have a fiduciary care for these companies in wanting them to succeed commercially. As a result, equity investors are more likely to invest their time and resources in helping the companies recruit top management staff. One current DFI investor exemplified this point by comparing her support to companies as a debt provider with the support she previously provided working for a venture capital firm offering equity investments. In her current position, they provide debt; in her previous position, they were equity investors.

"I think when you are an equity investor, I feel like you are more invested in the company for a longer time, and you care about how they do. For example, when I was at

AHL Venture Partners, we had invested equity in a company called 'Kampuni'. We were helping them even to recruit a CFO. We were helping them with that; even the investor sat in some of the interviews, and I was with them on the committees. On the other hand, I feel like when you provide debt, you feel that you have given them what they need, and you do not want to know other things. At AHL Ventures, we also had grants, and because we had an equity position in the first place, we were supporting, and it was okay. We did not bring that company a consultant. There were proposals to have like a consultant, but then we said no, let us help people internally. Let us look for a good CFO. Currently, as debt providers, we identify our consultants who give them support services, for example, updating an HR policy. Then, we pay the consultants, and we do not give the money to the company."

(Patricia, Investment Officer, DFI)

Off-grid companies, particularly the subsector of solar minigrids, have experienced the challenge of attracting equity financing. Due to the nature of the project, many wanted to attract debt project financing, sometimes restricted to the construction cost and customer connections. As a result, many companies struggle to fundraise due to a lack of equity financing, which could be used to hire talent. This challenge trapped some companies in a capital-scarcity loop, which they struggled to overcome. Hence, funding the team or talent acquisition is one of the enabling factors for a company to raise capital and effectively execute a project. Equity financing, which is even rarer in this subsector than debt financing, can help overcome internal challenges such as talent acquisition. Eloise described this challenge by highlighting the following:

"It is just so frustrating. People want to fund projects, and they want to fund the minigrids, but people do not want to fund the teams. So, how will they build minigrids if they do not have a team? How will they fundraise if they cannot afford a chief financial officer? And because it is really difficult for equity providers to fund equity into the mini-grid kind of companies ... Now, obviously, people need to pay their teams as little as possible because they are trying to make the financials work. But the truth is, if there's no money to hire skillsets and talent, then you remain in this unprofessional loop that we cannot get out of."

(Eloise, Investor, Philanthropic Foundation)

5.7.2 Guarantees

This section discusses guarantees and their role in unlocking more capital for investments. Though not as common as debt and equity, guarantees offer a safety net to funders to invest more capital due to their total or partial assurance. This approach is a vital risk mitigation tool often used to reduce credit risk, but it may also be used for equity. The total or partial elimination of the capital loss risk gives investors more confidence to disburse more capital than they would without the guarantee. This approach unlocks new capital and, most importantly, has the potential to unlock local capital.

Risk averseness, prevalent among investors, stems from the fear of losing their investment and running a loss. Ultimately, whether it is a ‘green’ investment or not, the bottom line for many is to make a profit, and a financial loss is a consequential failure. Many institutional investors who manage funds on behalf of others have a fiduciary obligation to their clients and shareholders. It is unsurprising, then, that an investor’s confidence is boosted by risk mitigation tools, such as guarantees, because they minimise the extent of the potential loss. Given that the extent of loss is often uncertain, even after rigorous vetting and creditworthiness assessments, having a confident assurance of recuperating a portion of one’s investment is a great cushion that motivates many not only to invest more but also to attract others who would otherwise consider an investment too risky. By reducing the downward risk, you attract more capital from existing investors while encouraging new ones to join. A DFI investor who invested in fund management firms echoed this point.

“The guarantee enables a fund to get other investors into a fund, knowing that they won’t lose all of their money; we would cover half of the money if the loans do not perform. ... An example is our first guarantee was with Trine, the crowdfunding platform. We started discussing. They had lent two million euros, and when they heard about the guarantee, we talked. They said, well, this could be really strategic for us because it could enable us to broaden the investor base, give them more confidence, get more people on board, and raise more money quickly. The effect of the guarantee was that they could get more money in; the ones on the platform were investing more

money and frequently. Also, they could raise funds for companies like BBOXX and give loans up to six million euros instead of the smaller amounts. Also, they could raise a million in a couple of days. So, that's the way a guarantee can be catalytic."

(Alan, DFI, Investor)

Guarantees can incentivise the private sector, especially local private investors, to invest in the energy sector. Many investors echoed the reluctance of local financing institutions to invest in climate-related projects. Bernard, a long-time research practitioner and implementor, highlighted that, having observed this challenge and interacted with the local financial institutions, he found they perceived the sector as riskier because they felt they did not have sufficient technical expertise in the energy sector. He hoped to work with their development partners to eliminate this challenge.

"You have local financing institutions with equipment financing facilities, for example, in tractor mechanisation, which is part of the productive use component... For years now, these financing institutions have built their own internal expertise to understand equipment financing better. However, just because you lack the technical expertise in solar energy, you decide it is not for you. It is not because it is difficult; you perceive it as risky because you do not understand. Our current conversations with financing institutions, that is one of the things that have come out. That they do not have the internal expertise to understand the renewable energy space; in this case, we have proposed to our partners and funders to establish a programme where we can work with local financing institutions to build their internal expertise to understand the sector."

(Bernard, Research Organisation, Africa lead on Energy Access)

Bernard stated that building technical expertise capacity is just one way of getting local financial institutions on board. He believed that, although, as a country, Kenya has instituted beneficial policies to attract investors, derisking mechanisms and facilities that use guarantees can build investor confidence. He provided an example of the ecosystem work in which they partnered with a fund manager to design and structure a risk mitigation programme, which would be a first loss facility. Although his primary institution could not operationalise the programme, it moved to another institution. Nonetheless, the programme's operationalisation in a different organisation achieved

the expected benefits.

*“Kenya has done more in terms of putting policies and strategies in place to attract or build investors’ confidence. **Certainly, one way to do it is to provide guarantees**, for example, for private sector investors to build confidence to bring resources into the sector (...). We also wanted to pilot how we can unlock local private capital, **especially from local financing institutions** for healthcare electrification. So, we were working with another institution called Green Max Capital, which is a fund manager. We had initially started structuring or designing a derisking mechanism or facility with them. We had started designing a risk mitigation facility with them. We were interested in philanthropic institutions and foundations to put resources into the first loss facility. What that means is let us deposit X amount of money with several local financing institutions. In Kenya, we worked with Equity Bank and KCB. As local financing institutions, if you advance your resources, for example, to Tunza health care facilities, [and] if they defaulted on the loan repayment, you can tap into this facility and recover 20% of your first loss. Then, you can quickly have a conversation about how we can overcome this. **To be honest, since that facility started, we realised it has helped a lot in building the confidence of institutions like Equity Bank to put money into this sector while they learn the sector more from a risk mitigation perspective.** Now, we are piloting in the healthcare electrification. But we want to understand how to unlock local capital for the productive use sector. So, first and foremost, risk mitigation is one of the facilities. We are also pushing in terms of how institutions like the AfDB and DFIs can set up a facility with local commercial banks to let them invest in this sector .. So, all these are the things that we are piloting to understand better how we can be able to unlock both the international as well as local financing.”*

(Bernard, Research Organisation, Africa Lead on Energy Access)

Other actors believed Kenya's trailing green bond market should utilise guarantees to incentivise and attract local investors. Local financing institutions (banks) are not the only institutions reluctant to invest in the energy or climate-related sectors; insurance companies are apprehensive, and pension schemes even more so. One effective method of raising funds in capital markets ³⁴ is by issuing bonds, especially for large

³⁴ Capital markets are organised primary and secondary markets in which investments and savings from individuals, businesses, institutions and governments can sell or buy long-term securities (stock and bond markets).

infrastructures. In Kenya, sovereign bonds are more common than corporate (private bonds). Acorn Holdings issued the first (green) corporate bond, cross-listed in the London Stock Exchange (LSE) and the NSE, which was undersubscribed at 86%. The bond aimed to raise funds to cover the construction costs of building an environmentally friendly student accommodation (Magale, 2021; Taghizadeh-Hesary et al., 2022). Although some reasons for the trailing green bond market in Kenya are contested, many agree there is a lack of awareness among potential investors and a lack of or poor risk management tools. Kenya has not been as successful as its peers Nigeria and Tanzania. Gia, a capital markets specialist in Kenya, working to enable the capital markets environment, echoed this point.

*“For us, we are trying to understand why. Why are green bonds not working in Kenya? We were expecting Kenya to lead more than Nigeria, and it is not. (...) I lead this programme; it is called the African Pension Supervisors Association. Right now, we have about 15 countries, and we have approached a lot more of them. So, part of our work streams in that programme is capacity-building(...). We have had pension schemes coming to tell us, you know, if you convince the trustees, the ones with the money, and you tell them the importance, then these people will understand. So, we are currently trying to build a curriculum that would be used to conduct that training(...). We will roll it out also to trustees, fund managers, so the whole ecosystem, just to get them in and understand. **Because, if you ask me, of all sectors, pension is the hardest to crack.**”*

(Gia, Technical Capital Markets Specialist, Investor & Development Agency)

Gia added that, as an organisation, they use grants to develop capital markets and mobilise capital within the ecosystem. She provided an example of her company using grants to set up a guarantee facility in Kenya that will offer a 100% guarantee to pension schemes and insurance companies that choose to invest in green bonds. She stated this approach is similar to a facility they set up in Nigeria. Gia mentioned they provided a returnable grant to set up the facility to cover the costs of critical staff, such as hiring top executives, policy formulation and payments to consultants who help incubate ideas.

“So, there is a credit guarantee scheme that we have helped to establish here in Kenya. It has yet to have a formal name, so for now, we call it the Kenya Credit Enhancement Facility. So, we put in money, a grant for the establishment, the setting up, like hiring the CEO, setting up the policy, and working with the consultants who incubate such ideas, and then we pay them. It will be launched sometime this year. It is meant to eventually be regional to the rest of East Africa. So, what it does is guarantee green bonds that are issued only to the infrastructure sector. So, anything green around infrastructure. Anyone who wants to issue, they will guarantee 100%. The main logic behind this is to attract those pension schemes. We had to find solutions to bring them. Because when you are told you are guaranteed 100%, you know if you give money here, you are guaranteed 100%. If this person defaults, we will pay you 100%. So, why not invest?”

(Gia, Technical Capital Markets Specialist, Investor & Development Agency)

This section discussed the use of guarantees and their effectiveness in reducing risk averseness among investors, building their confidence, and providing a safety net in case of a default (in debt provision), leading to increased capital mobilisation, quicker and more frequent capital provision from existing investors, and, equally important, broadening the investor base by attracting new investors. The benefit to companies is that they receive more capital quickly. One of the pertinent discussions about capital provision is the foreign exchange risk that locally operating companies face. Most capital accessed is in foreign-denominated currencies, and their revenue is collected in local currency; this risk continues to challenge many companies. As a result, the need to mobilise local capital has now been acknowledged and is keenly being pursued. Actors consider guarantees an effective instrument to lure risk-averse local financing institutions. However, this approach cannot be taken in isolation; much awareness, capacity-building, and sector engagement are required.

Not only are guarantees catalytic in unlocking the mobilisation of more traditional capital from local investors but also in their potential to enable the adoption and growth of new trailing ones, such as green bonds. In addition to the latter, the local investor base could be expanded to include a more (financially) conservative group of insurance companies and pension schemes. Given the scarcity of this financial

instrument, one hopes this may continue to grow to help increase the volume of capital flow from local investors to companies, eliminating or reducing the FX risk. Regardless, one aspect that is not clear is whether this financial instrument will reduce the cost of capital. Given that one of the defining features of guarantees is the recovery of whole or part of an investor's capital, will this risk reduction be reflected in the pricing of the cost of capital? Although this research does not answer this question, it acknowledges the many benefits guarantees will offer to energy companies should they increase. This study also provides an innovative use of grant financing beyond the traditional use. This section narrowly discussed the use of grants in setting up guarantees; the following section discusses the use of grants in a broader sense.

5.7.3 Grants

Although grants constitute a small portion of the capital provided, they play a vital role in companies and the energy sector. In the off-grid industry, grants helped companies to do the following: reduce the cost of off-grid products, expand to new geographical regions, research customer acquisition of new markets, reach underserved populations, finance technical assistance, incentivise performance or results, and make early investments (free equity).

Grants constitute a small portion of the capital provision since they are mainly non-commercial and often non-refundable. Only 2.59% of capital provided to the off-grid sector was grants, and over time, this figure continues to decline. This research found that the amount of grants provided between 2012 and 2016 dropped by 84.64% compared with those between 2017 and 2022. Lea echoed this point:

*"I think most companies are growing through debt or through carbon finance presently, and some grants, but again, there's a **reduction in grants over time.**"*

(Lea, Director of Country Transitions, Industry Association)

The off-grid sector mainly serves low-income households with low purchasing power. In addition, some markets have high customer acquisition costs. Without subsidising the cost of energy products, companies cannot attain commercial success. Hence, grants play a critical role in providing companies with additional financing to subsidise

the cost of products to levels of customer affordability, to expand the business to new geographical regions that otherwise would not have been commercially sustainable, and often to fund market research to inform such expansions. In new markets, grants fund customer outreach and awareness, reducing customer acquisition costs. Many interviewees highlighted this use of grants. Edward, a manager at an off-grid energy company, described the usage and benefits of grants.

*“We also seek external finance, mainly grants from investors. First of all, we **started as a start-up, so we had to look for that kind of finance to set up the company.** But even after that, **those finances have made it possible for us to distribute these products at a really affordable price and reach customers even in rural areas.** (...) so I can say that the purpose for the grants is to make our products affordable to customers. For example, let us say you are an impact-driven company, and equally, you must make profits; some countries lack a favourable business climate to set up a business. As much as the business would impact people positively, those areas are not favourable for business. **So, we have some financiers or even companies giving grants to us, not even to sell specific items, but for us just to set up a business there,** because if we can set up a business there, automatically we’ll sell our products in the country, and in the long run, impact people’s lives positively. Also, **the grants can be used for day-to-day activities,** so that, at the end of the day, they reflect at the customer level. **Also, some of these grants can be used to create awareness and subsidise some of our products; for example, cookstoves are heavily subsidised because of this kind of finance.**”*

(Edward, Manager, off-grid energy company)

Although grants benefit companies in the many ways described above, they also come with strict mandates and, at times, are stringent for the funded companies. Some investors have a specific and narrowly inflexible usage of grants. Strict operational, strategic and geographical mandates may limit the usage of funds and, at times, influence companies' geographical and strategic plans to access finance. In other words, the companies implement mandates attached to capital in the ecosystem rather than the flow of capital going to implement companies' strategic plans. When the investor and company mandates coincide, grants have helped such companies use grants to expand to new geographical regions. However, to others, the implementation of fund's

mandates instead of theirs highlighted helplessness since they lacked their capital and relied on grants that determined their geographical expansion or controlled it. Edward highlighted the strict nature of grants:

“So, I can say there are different ways we use grants, and even some of the investors are very specific on how they want their money to be used. So, some of them would say we are giving you this money so you can expand in a specific country. If you’re not going to use that money for that purpose, you better return that money to us.”

(Edward, Manager, off-grid energy company)

Another interviewee, from a solar mini-grid company, described how, although the country regulations are still a key deciding factor on where to establish a business, due to a lack of capital, they chased grants for whatever geographical regions they could find financing for. Although this approach brought expansion, it led them to regions they would not have otherwise gone had they had their own capital.

“Ideally, you want to be in fewer countries. You don’t want to be in just one country because you will also expose yourself to geopolitical risk. You know, what happens if the regulation changes or something else happens? But also you don’t want to be in too many countries. And what we found was that when we didn’t have our capital, you had no choice but to chase the grants wherever they were, to chase both the financing and also to be pulled this way and that way depending on the reach, but regulation still remains a driver where we do business. But if we have our own capital to deploy our assets, then we choose where to build them, and we can decide a more strategic expansion that’s less costly in terms of overhead.”

(Jack, Chief of Utility Operations, Distributed Renewable – Energy Utility)

It is difficult to prescribe a solution to this issue, since investors, especially fund managers, have mandates given to them by those who invest their funds, and they are evaluated against such mandates, which highlights the struggle of energy companies regarding accessing capital. Companies sometimes have no choice but to fulfil more costly mandates to access existing capital due to its scarcity. Some of the existing capital does not reflect the needs of companies operating in the energy market. Nevertheless, investors believed that supporting businesses (through grants or repurposed grants),

as opposed to NGOs or social enterprises, had a sustainable impact in the long run.

“We believe in fostering enterprise solutions, because history has shown that when NGOs provide the equipment or the energy solutions for whatever reason, after time, when you go back, it is no longer running. So, we believe in building businesses even though we do not take a return in it.”

(Eloise, Grant Manager, Philanthropic Investment Foundation)

Another investor, Shaun, echoed Eloise’s view by highlighting his company’s finances commercial businesses and not grant-reliant social enterprises. He believed that commercially viable and sustainable businesses operate longer and achieve a more significant impact.

“I believe that operationally viable companies can create more impact in society overall because they can sustain that in the long run than companies that might not be operationally viable. And then, you know, if they try to create a lot of impacts all at once, but they are not operationally viable, then they might be able to make a very limited impact because they might not sustain for a number of years.”

(Shaun, Investor, Impact Investment Fund)

In addition to providing grants to start-ups and growing businesses, investors used grants to finance technical assistance (TA) and advisory services. These services build the capacity of companies to improve capital access. TA assisted companies with compiling their company documents for fundraising, helped them build financial models, and trained companies in fundraising. Lea and Garry highlighted how their organisations use grants to support companies in the off-grid sector.

“My company has a grants programme targeted at the private sector, less of direct grants but mainly providing TA. But quite a bit of that work is helping companies increase their access to finance: for example, how to put the business fundamentals in place to raise capital successfully.”

(Lea, Director of Country Transitions, Industry Association)

“We also provide technical assistance for a variety of purposes, including deepening gender

inclusivity in these organisations. (...). So, we take this seriously and have occasionally provided funding to assist various organisations willing to take advantage of such facilities to be more inclusive. This is alongside other technical assistance funding in the form of grants that may be very specific to solutions within the productive use of energy space."

(Garry, Investment Officer, Private Equity Firm)

A few investors and companies voiced sharp criticism of the indirect use of grants to provide advisory services through consultants. They mentioned that, although beneficial at times, such services do not help struggling companies with their immediate and most pressing needs. Some interviewees highlighted that, at times, and when needed, it is better to channel the grants directly to companies instead of external advisory services that are time-bound. Eloise criticised grant financing because it does not address the imminent needs of companies. She provided an example of a funding programme that spent US\$100 million on consultants to train and help mini-grid developers with financial modelling, many of whom were hesitant, stating that similar financial models did not give them a competitive advantage. Instead, the developers would have preferred their teams be funded. Eloise passionately explained her frustrations as follows:

"There's a high push on the cost of connection on the developers. Is it US\$400 or US\$500? I am like, none of the mini-grid companies is floating in money; they're all struggling to pay their team(...). Donors start the same programmes year after year, but what is really lacking is money getting into projects.

*Also, if the teams have more money, they can hire talent. You know, **these capacity-building people should just be working with early-stage entrepreneurs and giving them funding in their team, so that they can hire a CFO.** Do not get me started on Investor X. They have this programme, so it all went to Consultant Y, tens and tens of millions of dollars. And then, Consultant Y subcontracted Company Z, and all they did that I knew of on the private sector side was trying to help them with their financial modelling and advising. **Most of the developers I work with walked out because they asked why a consultant would build my financial model and then also build the same for my competitors.** It does not make*

sense. If they had taken those millions of dollars, it was like one hundred million even and hired CFOs for all the companies for five years, the rest of the finance would have gone into connections. And sadly, they are going to do it again for the next four years again. This drives me crazy."

(Eloise, Grant Manager, Philanthropic Investment Foundation)

This finding highlights two key issues: first, some investors and companies believed certain grant programmes are not responsive to the real needs of companies and are not effective in supporting companies; second, the grant programmes need to improve their efficiency in managing funds to ensure the maximum possible finance goes to the companies for operation or to address other pertinent needs. These critics stated that although TA and advisory services are necessary, their success is only contingent on the strength of company teams. Internal capacity-building within the companies is more long-term and sustainable than the occasional external advisory service. On their own, advisory services can benefit the value of the companies, but they are not as beneficial as a team that brings that expertise in-house.

Other interviewees voiced a contrasting opinion, highlighting that some companies receiving advisory and TA found it more impactful than receiving money. One of those voices was a DFI investor who mentioned that his organisation ensures that most of their investment trickles down to companies and that advisory services are a crucial part of the ecosystem to build capacity. He stated that, in his interactions with their investees, some even hailed such services as more beneficial than the money.

"They are also provided with strategic business advice by experienced people, and they sometimes even talk more about how it is beneficial than money. At the same time, with Fund Manager F, they also provide business advice, so it is important. And in the two cases, Fund Manager F and Fund Manager B, it is not only advice but money and advice. But then I have also heard companies that have been contracted that they also find Fund Manager G, which only provides advice, to be very useful as well. So, I don't want to rule any of them out."

(Alan, Investor, DFI)

These contrasting views regarding grant utilisation, TA and advisory services to companies suggest that, although both are useful, building internal capacity may be more sustainable for companies in the long term. The caveat is that this approach depends on the size of the grant. Grant programmes with small amounts may find it more impactful to pay advisory services and build the capacity of multiple companies. However, it is more impactful for large grants to finance a team for early-stage companies. For example, instead of teaching a company about fundraising and document compilation, hire a CFO who can lead the fundraising process internally and build the team's capacity in the long term. Training key personnel with foundational expertise is more effective than offering the same training to a company without the key personnel. For example, training a company's CFO to fundraise efficiently is more effective than training a company without a CFO on how to fundraise. Helping companies build teams is a more urgent prerequisite for capacity-building in most cases.

In addition to providing TA, investors also use grants to encourage performance and attain results. Hence, many grants are structured as milestone- or result-based financing. Many investors and energy companies highlighted that grants are used to incentivise and encourage results. Furthermore, the performance results act as checks and accountability mechanisms that ensure companies are only funded according to their results. In essence, it is a reimbursement structured agreement in which a company must perform and complete specific tasks and is then reimbursed for their costs. Jack, chief of utility operations for off-grid solar minigrids, made the following point:

"I would say that the main form of grant that comes into these deals comes in post-construction. You only get the grant once you've built the assets."

(Jack, Chief of Utility Operations, Distributed Renewable – Energy Utility)

However, this system presents a unique challenge to companies. Suppose grants are provided only after achieving results or milestones at the post-construction or distribution stage, using metrics such as the number of connections to customers. In that case, this approach only favours companies that can finance the early-stage development phases. Thus, there is a void in which most companies struggle to raise finance in the early stages and can never reach the post-construction stages in which they can receive the financing. Linda, an investor who worked with developers such as Jack to help fund the procurement stage, reiterated that most funds from government-based institutions, such as DFIs, are milestone-based and slow in disbursing grants. She highlighted that although her organisation does not fund the earliest stages of development, once they start working with a developer at the procurement stage, they reimburse the company the development cost in the hope that the DFIs will pay out the grants later. Hence, when paying out to companies, a portion of the cost is for capital expenditure (CapEx), and the other is for development cost. Development cost is the cost incurred by a company when doing the foundational work of identifying viable mini-grid sites. This work includes engaging the community and its elders, conducting Environmental Social and Impact Assessments (ESIAs), identifying mini-grid sites, land acquisition and market surveys. Companies such as Jack's are fortunate to work with investors like Linda, who become involved at the procurement stage, pay CapEx and reimburse the development cost. Linda mentioned that most companies that work in isolation struggle to obtain financing because they must cover the development cost themselves and wait for a reimbursement post-construction. Few companies can afford to cover the development cost, move their project to the procurement stage and secure investment partnerships. Linda explained the situation as follows:

"I mentioned at the beginning that people would work in isolation, so you'd have some folks doing really impressive work, but the challenge with that is it can be really hard to find financing because you need to do some development work at some sites long before you actually do any construction or bring in equipment. So much development work goes into just getting the site ready, but we come in at the procurement stage. The minute you have sites you like and have

identified vibrant communities ripe for minigrids, you can come to us for financing.

A lot of this grant funding is milestone-based. So, they'll tell you, 'Show me you've done development work up to here, then I release the first milestone; show me you have constructed or set up metres up to here, show me you have done surveys.' It's like give me something tangible, and then I release. But even then, practically, it doesn't mean things on the ground will move as quickly. So, what happens is for the developers that we work with, all of the development work they've done to get a site to a place where we can now start procurement, shipping and installation is that we reimburse them for development work. So, we'll reimburse you for development costs when we are paying out, let's say, the milestone for procurement.

What we do sometimes would cover the gap with the grant money, provided we know that the grant money can come (...) You'll realise a portion of a lot of our milestone payments are partly Capex, and there is a portion of it that caters for [the] development fee."

(Linda, associate Director, Investment Company)

Although grants can be catalytic when provided at the earliest stages, the interviewees highlighted that many come at later stages to incentivise companies to expand their service provision to more customers, especially in the minigrids sector. This strategy leaves a glaring gap for companies regarding covering early development costs. Arguably, this model only favours large companies that perhaps can access commercial rate financing to cater to these costs while awaiting reimbursement during the final stages.

Finally, the research also found that some of the large public institutions, such as DFIs, often invest through fund managers, such as impact investment firms. Such large institutions are not institutionally structured to invest directly in companies. As a result, these institutions partner with institutional investors and use them to channel financing to companies. Through such arrangements, some large institutions provided grants to institutional investors, who subsequently invested in energy companies through debt or equity. These are repurposed grants transformed into other financial instruments at the company level. Hence, what began as a non-commercial financial instrument at the point of receipt to the fund manager is transformed into a commercial financial instrument when it reaches the company stage. Shaun, an impact investment firm

investor, highlighted this point, stating his company's fund is structured to provide debt and cannot give grants to companies. However, he mentioned that their funds sometimes receive grants from investors, who then mandate them to provide such finance as debt to companies.

"We can't give grants to the companies, because that's not how the fund is structured; the investors can give grants to us, but they expect us to give it as a debt to the companies. (...) you see that [with] all impact investment funds; they do it in the form of a debt. But the debt interest is a low percentage in comparison to the funding they will get from any other source."

(Shaun, Investor, Impact Investment Fund)

To verify this point, we interviewed several DFIs, particularly one that partners (and funds) several funds and investment firms. The interviewees highlighted that they have partnered with multiple investment firms in East and Central Africa. They invest in debt providers and other funds that, along their investment chain, finance companies that provide equity to companies. Alan, a long-time investor, stated that 75% of his organisation's funds trickle down to companies for operational use, and from their perspective, they think of these grants as free equity, since it is financing used for the day-to-day running of companies. They do not ask for a portion of shares in the company or any returns.

*"Seventy-five percent of our funds go to companies for their operations. **We call it free equity.** We're not asking for a share in the companies. **It can feel like free equity.** We're not only paying for results once they are delivered, but we are also paying against milestones set up in the beginning. We want to see these companies succeed and become profitable and sustainable over time."*

(Alan, Investor, DFI)

In Alan's example, his organisation provides most, if not all, of their funds as grants. These grants are then invested or provided to their partners (fund managers) as grants. These institutional investors then provide the same funds to companies as debt or equity. Therefore, although the original investor, the DFI, views this funding as free equity they provide, the final recipients (off-grid companies) receive the financing as

commercial capital. Hence, in this capital transformation, although the original capital was free and could fund catalytic activities, they receive commercial financing and they ought to repay or relinquish some of the company's equity. That is of the pipeline impact.

The results in this section indicate there is still a need for grant financing to support early-stage companies. Grants are needed and utilised to achieve product affordability, reduce the cost of customer acquisition, grow and expand to new geographical markets, finance market research, incentivise results and fund advisory and TA. The results also confirmed that direct grants to companies are reduced over time. Arguably, it is highly probable that, in part, this reduction is because a lot of grant financing does not directly trickle down to companies. The results highlight three flow structures of grants: direct, indirect and repurposed (transformed). Direct grants are those provided directly to companies to cater to general or specific needs and may be reflected in their financial books. Indirect grants are those used by investors or donors to pay for services that benefit companies. Hence, they do not receive the money but the paid services. Repurposed grants are provided by large investors to fund managers who transfer the same capital to companies as either debt, equity or guarantees. The results also indicate that, although indirect grants help provide advisory services to companies, direct grants that address urgent and pertinent needs of companies should be prioritised.

The results reveal that grants still play a crucial role in helping companies grow, especially during the early stage. With the evolution of grant usage, especially those repurposed to catalyse more capital mobilisation in the sector, the use of grants continues to be dynamic. The hope is that the redirection and repurposing of grants will not starve off the direct grants still needed at the company level. The following section discusses debt as a critical commercial capital many companies use to finance their operations.

5.7.4 Debt

This section discusses debt as one of the vital financial instruments used to provide capital to companies in the energy market. In the off-grid sector, debt is one of the

market's two most common capital provisions, and its popularity continues to grow. Between 2012 and 2016, debt constituted only 20.41% in the off-grid sector and grew to 52% of the capital provided between 2017 and 2022. Consistent with the entire sector, debt from international public sources to the broader energy sector constituted 87.74% of all the capital invested, as discussed in section 4.4. As a result, debt is common, accessible and valuable for obtaining capital for companies to operate and grow. This section discusses the role of (long-term or short-term) debt, the accessibility of debt relative to other forms of capital (investor's preference to provide debt over equity), and trade-off factors that companies consider when selecting a debt provider.

Many companies raise debt capital to finance core business activities to expand, grow and fund specific or general operational company activities. For off-grid companies, especially those selling their products using a distributed cost mechanism, the PAY-GO system, in which, although, on paper, they have accrued revenue from sales, takes months, sometimes even several years, to receive the total cost of the product through instalment payments. In this period, companies still need to operate, buy inventory and make more sales. As a result, these companies seek long-term or short-term debt to finance their businesses. All the interviewees agreed that debt is necessary, especially to fund a company's operations. Miles, an investor and a director at a fintech company, highlighted this point.

"Our company focuses on the shortage of debt capital. So, because these are lending businesses, it is critical that they raise debt. That is how they finance their growth. They need to finance their accounts receivables essentially to allow them to keep purchasing their inventory and continue their operations while waiting for customer payments to come in."

(Miles, Director, Investment Firm & Fintech Company)

Although all the interviewees agreed that debt is necessary to raise funds to operate a company, choosing the type of debt and its provider is not straightforward; it is a trade-off between the level of oversight, cost of capital and the timely approval of the capital. A low-cost debt, perhaps even with a long tenure, requires additional controls and engagement from debt providers. To enjoy these benefits, the debt provider also performs rigorous due diligence, which can take a long time; hence, this is not capital

that caters to urgent short-term needs. However, short-term debt providers have less engagement and little control and can disburse capital after sufficient due diligence, but they will have a higher cost of capital. Therefore, companies must weigh these factors carefully. Titus explained this point in detail:

“When I came to the company, there was an obvious need to bring in more capital. The 80 million was to be deployed fully fairly soon. We felt that it was the right time to bring in debt at that point. We had lots of conversations for two years with potential funders. Ideally, you have a long-term senior debt solution in place that can sort of be there for a long while and give you a low cost of capital, and you can repay them over a long period. But that might take nine to 12 months to bring in, you know, a long due diligence process with the lenders to get to that point. So, at the end of last year, we decided to secure a bridge facility with a tenure of only two years. It’s easier to get on board because it may only take six months to close the deal. So we’d have the money sooner. (...) I think the main consideration is the level of oversight and involvement. Your ideal investor would be someone who is very hands-off and has deep pockets and can keep funding you and is happy to keep funding you and lets you run the business in the way that you want to do it and also has a very low cost of capital. But that probably doesn’t exist, and it’s a trade-off. If you want the low cost of capital, you’ll probably have to trade that for more oversight and controls. And if you want someone with less and less control, you will need to give them a higher rate of return.”

(Titus, Finance Officer, Distributed Electricity Utility)

The discussion regarding the factors companies must consider when choosing debt also revealed that companies have various choices when selecting which debt provider to engage. Most DFIs provide long-term patient capital; there are other medium-term capital providers, such as venture capital and private equity firms, and short-term capital providers, such as some impact investment firms. The short-term tenors ranged from months to 3.5 years, whereas long-term debt ranged between 12 and 25 years.

“So, we take risk; it is a capital risk. We are patient. While a typical private equity fund would have a five- to seven-year exit horizon, we can go beyond that. There are cases where we provided 10 years, 12 years even, depending on whether the exit opportunities were available or whether

we are still needed in the company. (...) But for direct investments, I would say we want to do debt because it's like project finance. And so that means you look at seven to 18 years. "

(Walter, Regional Director-East Africa, DFI)

Others highlighted the importance of short-term debt in enabling investors to invest quickly and receive their returns equally soon. However, it is also apt to respond to emergencies that emerge rapidly, such as those that plagued companies during the COVID-19 pandemic, emphasising that having access to various capital provisions and arrangements increases the available solutions for companies within the ecosystem.

"So, this is the advantage that debt gives us that, after 3.5 years, like once we have supported the companies during their COVID phase and all those difficult times they were facing, we can get our money back, and the company can keep growing further with future opportunities."

(Shaun, Investor, Impact Investment Fund)

Surprisingly, an emerging theme among many interviewees was capital provision preference. Most of the investors stated the key reasons they preferred providing debt instead of equity, unintentionally and unknowingly revealing why debt capital continues to grow in availability, provision and absorption. Many investors admitted they (as organisations) are risk-averse. They cited that equity investments need more in-depth sectoral and geographical knowledge, and that equity investment requires more resources to perform a rigorous due diligence process and support the investee after the investment. A DFI investor, Patricia, highlighted that her company is risk-averse, and that debt is safer to invest, as receiving the initial capital and interest is almost assured, at least more assured than equity financing, in which there is always a risk of losing everything.

"Generally, as a DFI fund, we are a bit risk-averse. We prefer to start with debt because it is a self-liquidating instrument. You will get your money back at the end of the day. With equity, you may or may not get back your money because it's money that goes into the company, or you might get a multiplication of what you put in. Yeah, because it's like a seed. You need to be more risk-taking and believe in the company's growth. You have to attend board meetings, have your hands in that company, and have boots on the ground here. So, often, it is difficult for us to do

that.”

(Patricia, Investment Officer, DFI)

Another interviewee added that impact investment funds mainly lean favourably on debt provision because equity investments are much riskier and require comprehensive due diligence, and most importantly, the investor must have an in-depth knowledge of the sector and the operational geographical location. Shaun explained the following:

“Everything we do is in terms of giving debt; we look into the companies in detail and all those sorts of things, but when it comes to equity, you have to be super knowledgeable about the industry, the sector and the region you’re working on. Because you are on the equity side of things, you will have a long-term stake in the company, which is a lot riskier, and it becomes a completely different model for an impact investment fund. So, most of the impact investment funds you will see mostly prefer debt because they don’t want to go into the company for a long duration. Also, in terms of equity, it’s not that easy to get your money back, or you can’t make it in the short term, as you know, which requires a lot more understanding of the industry – even the small basics and everything. So, that is why it’s slightly different than most impact investment funds, which go on the debt side of things.”

(Shaun, Investor, Impact Investment Fund)

This section discussed the use of debt capital (long-term or short-term) to finance company growth, operations and expansion. The discussion revealed that, in Kenya, energy companies have a wide variety of capital providers who offer a variety of debt agreements. The chapter highlighted three broad factors that companies consider when selecting their debt provider: the level of oversight or control they are willing to relinquish, the cost of capital and due diligence duration against the urgency of the capital. Finally, the results indicate why most capital providers prefer to offer debt rather than equity. Many interviewees mentioned they are risk-averse, and equity bears more risk, since an entire investment could be lost. Debt is also preferred because it is less tedious: there is less due diligence and less engagement with the investee. This section highlighted why debt capital continues to grow, the usefulness of debt to

companies and, at times, its responsiveness to their needs. The following section briefly discusses the mode of capital access and presents data on the number of pathways investors and investees come to meet to enable an investment.

5.7.5 Summary of the Distinct Roles of Different Financial Instruments

Table 12: Role of different financial instruments

Financial Instrument	Role	Availability
Equity	- Leveraged for additional finance, such as debt - Links to investor's industry experience and networks - Receive advisory assistance, e.g., corporate oversight, hiring of senior corporate managers	This is the leading type of capital and is mainly clustered among large companies. It is rare for small- and medium-sized companies.
Debt	- Fund companies' operations and growth	This is the second most popular capital and is rapidly closing the gap. Investors prefer to provide debt over equity – most debt capital clusters in large companies.
Grants	Grants help to - Reduce the cost of off-grid products - Expand to new geographical regions - Fund research on customer acquisition of new markets - Reach underserved populations - Finance TA - Incentivise performance or results - Provide early investments (free equity)	It makes a meagre portion and, over time, continues to decline.
Guarantees	- A vital risk mitigation tool often used to reduce credit risk but may also be used for equity - Used to incentivise cheaper capital from more investors	Rare, but actors are working to establish local guarantee institutions with international partners.

5.8 Modes of Capital Access

This section discusses four key investor and company connection pathways that lead to capital access. This section first discusses the channels and pathways used to access capital and their effectiveness. Second, these findings are analysed and integrated with earlier findings to outline the '*ease and difficulty*' faced by companies in accessing capital. This research found that both investors and companies pursue different pathways to connect. Earlier in this chapter, the descriptive statistics highlighted that few large, internationally linked companies accessed most of the capital. In contrast, small and

start-up companies, at times local, struggled to access capital. Examining the energy investment ecosystem and the existing pathways partly explains these struggles.

Most investors and companies utilise many pathways to connect in pursuit of capital-raising or deployment. The four modes of capital access are direct cold reach, formal applications, referrals and networks. These four modes of capital access differ depending on the investor or the company, but the mechanics are the same. This research found that, although all four key pathways are necessary, referrals were the greatest determiner of successful capital access. The following paragraphs briefly discuss direct cold reach, formal applications and networks before highlighting the power and role of referrals in raising money. It is important to note that most investors used all or any combinations of these pathways. The name 'company' in this section refers to investment or energy companies.

Most companies stated they had contacted an investor or a potential investee directly. This mode of capital access is called "*direct cold reach*" because it involves contacting an investor or a potential investee with no prior relationship. The term borrows this from the common phrase 'cold emails', as stated by one of the interviewees, Patricia. This mode of access indicates a very low connection, no prior relationship and minimal overlap of network circles. Although several investors stated they reviewed all direct requests through their existing processes, similar to those coming through other channels, many admitted that very few such direct requests successfully led to an investment deal. While the reasons for this are broadly unknown, this research argues that energy companies that heavily rely on this method have low relational connections and networks and are less known companies, indicating small companies. When contacting a new investor directly, a company tries to establish a new relationship, build a new link and expand its network. Nonetheless, despite this initiative, investment deals rarely materialise. This research argues that low social capital and relational connections indicate the degree of capital-raising effectiveness.

Similar to many other investors, Andrew echoed that his investment firm is open to direct unsolicited requests from potential investees.

"We expect companies in our space to learn about us and to approach us to finance. So, we expect

to be solicited. We have no problem with unsolicited requests for information or financing. We just put every company that comes to us through a diligence screen, see whether it fits the mandate and go from that."

(Andrew, Managing Director, Venture Capital Firm)

However, despite many interviewees highlighting the same review process for direct cold outreach, many of these requests did not convert into an investment deal. Arnold admitted that direct emails or contact rarely led to a successful investment deal.

"I'd say we don't have a lot of deals that I can think of, even historically, that came in when someone emailed info... But I think a lot of our business is really a bit more on referrals, whether someone referred to us... introduced to us, maybe by their shareholders, maybe by other existing clients of ours."

(Arnold, Investment Director, Impact Investment Fund)

This point highlights that despite using the same review processes and due diligence for direct unsolicited requests, they are the least effective channel regarding capital-raising. The lack of connections and low social ties means a lack of familiarity between the investor and the company, hence a lack of trust. Trust is a key component of investment in Africa. The results are rather unsurprising, given that much of the literature mentions that stronger networks lead to successful capital-raising. The results agree with Fayulu, who found that venture capital investors invest heavily in four countries in SSA, Kenya being among these, through familiarity derived from existing social networks (2022). Given the low effectiveness of this method, the following paragraph explores the next mode of capital access: formal applications.

Direct applications represent a deliberate invitation by an investor to submit documentation and, in a way, indicate that it is looking within and outside its existing networks. Although those with previous relationships may have an advantage, ideally, with a fair assessment, those without should not be disadvantaged; there is supposedly a 'level playing field' on which players have different advantages, but all are promised fair assessment and consideration. Unlike direct cold outreach, applications signal an intentional and welcome consideration of those known and unknown to the investor,

offering those with low relational connections a fair chance to access capital.

A formal application is a critical pathway for contacting an investor. This research found that some investors required formal applications, whereas others mainly relied on their networks and referrals. Preference was determined by the type of investor and influenced by their procurement policies and the structures of their programmes. Formal applications allowed many companies to apply to programmes regardless of how a potential investee came about the information, with or without direct linkage or knowledge of the investor. For example, although an investor may directly

inform a company of an investment programme, they may still require them to apply regardless of whether they believe it qualifies. This aspect separates the channels of knowledge flow for an investment opportunity from the capital access processes. One DFI investor highlighted the following:

“Although financiers will try to approach you to apply, at the end of the day, you will have to apply regardless of how you hear about the opportunity. So, sometimes it’s advertised you apply; sometimes they approach you and tell you that you have the capacity to implement such a project; other times, it is basically both ways, where we approach a company, like try to pitch an idea, even despite them not having that kind of finance budgets. So, those are the three ways I can say.”

(Walter, Regional Director-East Africa, DFI)

Direct applications represent a deliberate invitation by an investor to submit a company’s documentation and, in a way, indicate it is looking within and outside its existing networks. Although those with previous relationships may have an advantage, ideally, with a fair assessment, those without should not be disadvantaged. It is a ‘level playing field’ on which companies come with different advantages, but all have the promise of fair assessment and consideration. Unlike direct cold outreach, applications signal an intentional and welcome consideration of those known and unknown to the investor, offering those with low relational connections a fair chance to access capital.

The third channel for companies to connect with investors, and vice versa, is through social and professional networks. For social networks, companies use social media

platforms, such as LinkedIn, to connect. Shaun, an investor, mentioned that his organisation has a strong social media presence. He highlighted that they contact companies and inform them of potential funding opportunities. Equally, companies interested in their funding contact them through the same platforms.

“But as an impact investment fund ourselves, we also reach out to companies on LinkedIn and other social media pages as well; you (a company) might be a good fit and can apply for funding. But generally, it’s been companies who have been reaching out [...] We have done a lot to build our social media presence.”

(Shaun, Investor, Impact Investment Fund)

All the investors and companies highlighted the usefulness of professional networks outside social media platforms. Many mentioned that industry events, such as workshops, conferences and seminars, help stakeholders to meet others in the same industry effectively and increase their presence and engagement among competitors and potential collaborators. Furthermore, participating in panel discussions and conference meetings had deal origination benefits. Sylvia, an executive at an off-grid energy company, explained the following:

“Then another avenue we’ve used successfully is being present at conferences, climate change conferences and sustainable financing conferences. Anywhere we are, we are touching on climate change, we are touching on carbon. We make sure that we are present; we make sure we walk around. So, just literally walk around and exchange cards, getting people to know you. Right now, it’s a lot easier.”

(Sylvia, Group Head of Public Affairs, Off-Grid Energy Company)

Professional and social network-building represents engagement to build weak social ties that might lead to successful capital-raising. This process casts a wide net over many stakeholders in search of the few that may convert into an investment deal. It is also a valuable method of building long-lasting weak professional ties that are leverageable in the future. Regarding relational closeness, although the weak professional and social networks are a step closer than the direct cold outreach, they are still a step away from referrals. These networks’ greatest utility is their potential to

convert weak ties to strong ties from a handful of new social relations. Although some of these weak ties succeed in capital-raising, they are ineffective in the medium-term, but they hold great promise for future capital-raising as the weak ties grow to become stronger and, thus, more potent. The strongest relational connections come from inner professional networks that can confidently offer referrals on a company to an investor.

Finally, the most effective way of raising capital was through referrals. From the early stages of start-ups, raising finance from family offices, who introduce these companies to similar or different investors, to scale-up stages being referred to potential investors by financial advisers or their existing investors, many believed the most effective way of capital-raising or deal origination came from referrals.

“In the investment world, most of the opportunities flow through the network you’re part of or through referrals. But we also intentionally go out to create the right kind of relationships. So, we have relationships with a number of fellow investors. Number two, incubators and accelerators, and number three, we also extend these to other financial institutions like banks and NGOs who are active in this space because you may never know where a fitting opportunity will come from. So, in a way, we have integrated ourselves into the entire ecosystem.”

(Garry, Investment Officer, Private Equity Firm)

Another investor, Arnold, supported this view, stating that most of their business deals come through referrals.

“I think a lot of our business is really a bit more on referrals, whether someone [is] referred to us or introduced to us, maybe by their shareholders or other existing clients of ours.”

(Arnold, Investment Director, Impact Investment Fund)

Another investor highlighted that financial advisers are key in referring her organisation to potential investors.

“Number one, rule number one is through financial advisers – the likes of KPMG, Grant Thornton, Open Capital (OCA) and CrossBoundary Energy. Number two is other investors. So, maybe the project is too big for them, and they want us to co-invest.”

(Patricia, Investment Officer, DFI)

Despite their success, especially within the professional investor networks, the limitation of referrals is that they can systematically and consistently circulate capital within the same companies. Insiders exponentially benefit, whereas outsiders struggle to penetrate those professional circles to their detriment because this means less chance of successfully raising capital. One investor highlighted this point.

“We are a bit unstructured; we do not do calls for proposals and all of that. I find we work more like a venture capital-type firm. Like being out in the market, getting references, but the risk for that, as highlighted to me through other colleagues, is to ensure we don’t just stay within our networks.”

(Eloise, Investor, Philanthropic Foundation)

Referrals are the most effective capital-raising pathway. Referrals indicate that companies have the nearest relational closeness to the referee. This relational proximity means they have strong professional and social ties; hence, their reference is greatly respected, creating trust and receiving proper consideration. One key finding is that most referrals come from existing investors, financial advisers and other stakeholders who work with companies to build a capacity, to grow and to raise more capital. This group of actors has (in varying degrees) insider perspectives of the companies they refer. In the case of an investor referral, a potential investor knows the referred company has successfully gone through due diligence and raised capital from the referee. What are the implications of these findings? These findings explain the investment clustering discussed in Section 5.4 and illustrated in Figure 11. Section 5.4 argues that investments cluster among a few large international companies. The figure reveals investment clustering around the top five companies, who secured 83.572% of all investments made to the distributed off-grid energy companies. A new interpretation can be deduced from the capital flow (clustering) in Figure 11. Such capital linkages could also be reinterpreted as (potential) referral linkages from the nodes (existing investors) to potential new investors to mobilise additional capital. Although this method is a positive for companies with strong professional ties to the referees, it highlights the struggle of those with few ties or even with none and undoubtedly explains why the same companies receive capital, whereas others

continue to struggle.

Having highlighted the four key channels of industry connections between investors and companies for capital-raising, it is clear that, ultimately, the companies used a combination or a mix of channels to make those connections.

“Sometimes they apply to our organisation, we reach out to them, come from within our networks, maybe meetings at conferences, saw a press release, sometimes we do have to go out and market, and that’s where we will be on panels and discussions, like going to conferences. Yeah, try to understand what’s happening, and obviously marketing, there’s origination benefit that happens.”

(Arnold, Investment Director, Impact Investment Fund)

5.8.1 Linking Modes of Capital Access to Capital Access

The section above discussed the four capital access modes: direct cold reach (outreach), formal application, networks and referrals. The research found that investors and energy companies use a combination of different pathways to raise/invest capital. To illustrate the effectiveness of the four pathways in raising capital, as discussed in the section above, Figure 15 displays the four ranking matrix quadrants.

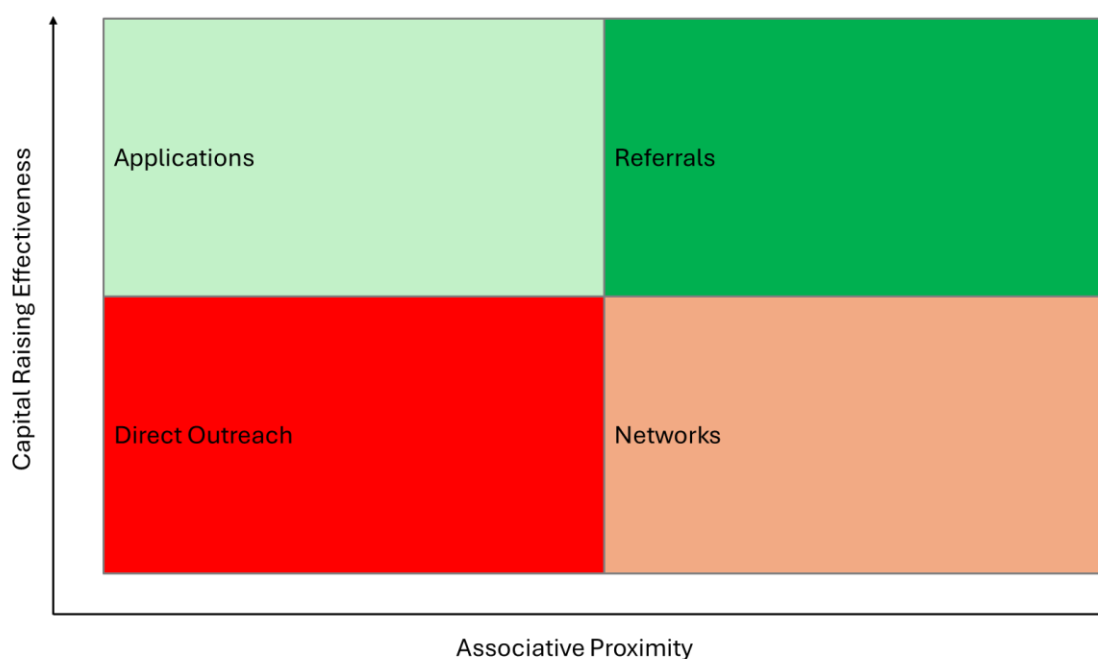


Figure 15: The Relationship Between Associative Proximity and Capital-Raising Effectiveness

Figure 15 above illustrates the relationship between the associative proximity of the four modes of capital access and their effectiveness in successfully helping a company raise capital. Capital-raising effectiveness is a measure of success or the likelihood of a prospective investment opportunity actualising. Associative proximity is a measure of the closeness/nearness of a relational connection between actors. The diagram illustrates the summary detailed in Table 13, below.

Table 13: Modes of Capital Access and their Effectiveness

Mode of Access	Effectiveness in Capital-Raising
Direct Outreach	This has low associative proximity and is the least effective method of capital-raising.
Networks	This has high associative proximity, albeit most networks are weak social and professional ties and have low capital-raising effectiveness. Nevertheless, this approach's deal origination is better than direct outreach, and its truest potential and utility lie in building on those weak ties to become stronger.
Formal Applications	Although most who apply have low associative proximity, except for those with close relational connections, intentional invitations for considering the known and unknown make this pathway effective in capital-raising.
Referrals	This was the most effective capital-raising pathway due to its high associative proximity. Referrals came from actors with strong professional ties and are regarded as trustworthy, leading to successful investment deals.

This section highlighted the multiple pathways to raising capital, providing insights into the clustering effect of investments. The discussion revealed one of the key reasons a few large international companies receive multiple investments from various investors, whereas others struggle. The most important finding was that those with strong professional ties and close relational connections with investors, financial advisers and accelerators are more likely to be referred to new potential investors and successfully raise capital from such referrals.

5.9 Conclusion

Chapter 5 discussed Kenya's private investments, informed by the GOGLA dataset and interviews. The chapter explored investment trends, dominant actors and their characteristics, the nature of the investments and capital access pathways. This chapter

responds to the first research question, focusing on private investments: Who are the influential actors enabling capital access in the energy sector in Kenya, and how do they invest?

The chapter began by examining factors favouring Kenya's capital-raising for the off-grid energy sector and demonstrated these through a regional comparative analysis. The findings reveal that not only did Kenya receive the highest amount of finance relative to Tanzania and Uganda, but also strongly indicate Kenya as the point of origin for technology transfer to other countries. This research argues that Kenya, having pioneered the PAY-GO technology normatively adopted by the off-grid sector, retains the pioneer advantage. This advantage and other favourable factors, such as high mobile ownership and SIM-card subscription, led to the sector's growth (Ministry of Energy and Petroleum, 2024). This growth led to the clustering of actors in Nairobi, facilitating more frequent engagement and relationship-building between the companies operating in Kenya and potential investors. Hence, Kenya became the '*epicentre*' of the off-grid sector and a '*regional finance centre*'. As an epicentre, the technology transfer and adoption in other countries did not dilute Kenya's pioneer advantage. Regarding Kenya as a regional finance centre, this research argues that companies operating in the country also had spatial proximity to the many investors and actors (lobbyists, industry associations, researchers) in Nairobi. The country's clustering of stakeholders brought more than finance. This advantage has helped companies operating in Kenya to raise more capital than those in neighbouring countries. This advantage is reflected in the country's capital access. In 2009, 1.62% of Kenya's population used SHS as a primary lighting source, compared with 19.3% in 2019 (KNBS, 2009; KNBS, 2019), which is 20% more than the KNES projected (MOEP, 2018).

At a country level, in Kenya, a few large international companies successfully raised capital, while many small (and local) companies struggled. This research analysed capital access regarding the following factors: the amount of investment received, the frequency of investment deals, the number of investors in each company, investor relational leverage and commitment, and company size. The striking findings reveal

that, in Kenya, 13.5% of the off-grid companies received 83.57% of the total investment, all during the scale-up stage, leaving 86.5% of companies (start-up and seed stages) struggling to raise capital. Inevitably, those that receive significant investments grow, and those that grow dominate the markets. Unsurprisingly, all the top five companies are mainly at the scale-up stage. This finding agrees with Baker that “[...] new private sector monopolies, mostly foreign-owned and/or backed by sources of international finance and investment, are becoming increasingly consolidated in the off-grid space” (2023, p. 218).

At the company level, this research disaggregated the data to understand the skewness of capital distribution among off-grid companies in Kenya using the same five factors. Overwhelmingly, the research found the amount of investment in an off-grid company had a direct relationship with the number of investors, the frequency of the investment deals and the size. Those with more investments were a few large companies with more investors frequently investing, revealing an investment clustering effect. Arguably, regarding causal relation, these off-grid companies had an investment appeal that attracted many investors to invest more frequently, leading to ‘above average’ capital access. Although this is a key finding, a more compelling finding is the investor relational leverage. Some companies, mainly large ones, leveraged existing investment relationships to secure subsequent or follow-on investments. The rate of subsequent investments from existing investors has two critical implications: one is that an off-grid company can leverage its existing relationship to access more capital, and the second is that the rate signals an investor’s confidence and commitment to the company’s growth, given their insider perspective and reduced information asymmetry. This finding, coupled with the critical finding that referrals were the most effective mode of capital access, reveals a compounded advantage of a few large international off-grid companies. These companies have multiple investors who are their internal linkages from which they could obtain follow-on investments, and the same investors were their connectors through referrals to external linkages with potential investors. External linkage through referrals is highly likely to raise capital due to trust in the confidence of existing investors and their insider perspective. One of the less obvious investment factors emerging from this research is that small companies struggle to raise capital

partly due to their obscurity. To be unknown is pernicious for capital-raising; the more people who know you, the better the effectiveness of capital access. Beyond the efficacy of capital-raising and its struggles, this research explored the nature of capital investments, particularly the financial instruments used to invest and their role and responsiveness to the needs of off-grid companies in Kenya.

A comparative and temporal analysis of financial instruments used to finance the off-grid sector between the early (2012–2016) and late (2017–2022) stages of the off-grid sector indicated the following: although equity financing consistently led over the years, in the later stage, its dominance continued to decline, and the gap between equity and debt was closing; although debt consistently ranked second to equity financing, in the later years it significantly increased, with more than double the number of debt investors and quintuple the investment frequency; and grant financing revealed persisting double woes regarding its consistent meagre proportion and its sharp decline over the years. Different financial instruments played distinct roles, and their utility and circulation differed in practice. Given these findings, this research argues that more companies will rely on debt financing, which is becoming more readily available to small companies relative to equity financing. Even worse, grant financing, whose catalytic role is essential to small companies, continues to decline, stifling the growth of such companies, restricting the number of investable companies in the sector and creating a limited investment universe.

Two key findings regarding equity financing stand out. First, the lead of such financing across the two stages was contradicted by stakeholders, with many highlighting its rarity. This evidence further supports the investment clustering around a few large companies, with further quantitative analysis revealing that almost half of the off-grid companies received no equity investments despite their lead in the sector. Second, equity financing was catalytic, above and beyond providing operational capital in the following ways: clients leveraged it for additional financing; clients benefitted from the investor's industry experience and networks, unlocking further funding opportunities; clients received advisory assistance on corporate oversight and the hiring of senior corporate managers; and clients received additional support through their investors'

programmes, such as TA.

Regarding grants, this research found their sharp decline over the years affected small companies that heavily relied on financing for the following tasks: reducing the cost of off-grid products, expanding to new geographical regions, researching customer acquisition of new markets, reaching underserved populations, financing TA that incentivised performance or results, and obtaining early investments (free equity). The decline of grants is partly attributable to circulation changes and transformation. The declining grant amount revealed reduced direct grants to companies, with indirect grants financing services or programmes for companies, and other grants transformed into different financial instruments. However, grant financing also financed programmes and TA services that indirectly benefitted companies. Repurposed grants were transformed into other financial instruments, such as guarantees or debt. However, direct grants continue to diminish. In addition to the meagre grant portion, the results also indicate grant financing is not responsive to the real needs of companies and is ineffective in supporting them. In this research, it was argued that grant programmes ought to ensure that most grants trickle directly to companies to address pertinent issues, such as team hiring. The results also indicate that although indirect grants help provide advisory services to companies, direct grants that address the urgent and pertinent needs of companies should be prioritised.

Debt, long-term or short-term, is raised to finance company growth, operations and expansion. This research found that, in Kenya, energy companies have a wide choice of capital providers who offer a variety of debt agreements. The chapter highlighted three broad factors that companies consider when selecting their debt provider: the level of oversight or control they are willing to relinquish, the cost of capital, and due diligence duration versus the urgency of the capital. Most importantly, the results also indicate why most capital providers prefer to offer debt rather than equity. Many investors mentioned they are risk-averse, and equity bears greater risk, since one could lose an entire investment. Debt is also preferred because it is less tedious: there is less due diligence and less engagement with the investee. These factors explain the rapidly closing gap between equity and debt financing and the influx of new debt providers.

Although the quantitative analysis did not include guarantees, actors in the off-grid sector highlighted their critical role in risk management. A guarantee is an effective tool that helps reduce investors' risk averseness, build investment confidence, and provide a safety net in case of a default (in debt provision). Due to the boosted confidence, guarantees encourage existing investors to invest more capital more quickly while expanding the investor base by attracting new investors. Off-grid companies benefit from this factor due to improved capital mobilisation by receiving more capital more quickly, which is a move towards capital sufficiency and timely responsiveness to the capital needs of a company. Furthermore, guarantees have the potential to bring local financing institutions, such as banks, on board, which is a step closer to addressing the FX risk that plagues many companies when attempting to access international financing. In addition to catalysing more capital from institutional investors, guarantees have the potential to revitalise the trailing green bond market, contributing to more capital flows in the energy sector and addressing the country's general capital insufficiency. More importantly, this factor incentivises risk-averse investors who would otherwise not channel their finances to the off-grid sector without guarantees. These potential investors include insurance companies and pension schemes. Given that some of these are local institutions, their efforts are additional to those of local financing institutions in providing local capital and reducing foreign exchange risk. This aspect becomes part of a valuable solution to alleviate the stress and challenges for founders and companies in raising finance. An industry report by Flourish Ventures in 2024 found that capital-raising, inflation and FX risk were the most significant stressors for founders in Kenya and other places in Africa: 59% of founders stated being stressed by capital-raising, whereas 44% highlighted inflation and currency devaluation as key stressors (Flourish Ventures, 2024).

Chapter 6: Facilitating Capital Access: Investment Decision-Making Factors

6.1 Introduction

This chapter focuses on actors' (investors') practices regarding investment decision-making and the factors that control or influence the selection of investees. This discussion centres on three concepts of financial ecologies: actors, practices and relationships. This chapter helps to understand the assessment, evaluation and selection of energy companies to provide capital to answer the second research question: What factors control investment decision-making for energy investments in Kenya?

This chapter builds on the previous chapter, which found an investment clustering that has resulted in uneven investment outcomes, favouring a few large international companies that raised capital while many small (and local) companies struggled. These large companies had an investment appeal to investors, attracting many investors and receiving investment deals frequently. Moreover, the overall sector experienced a scarcity of catalytic finance, such as guarantees, and most small companies struggled to raise grants and equity finance, stifling their growth. Hence, this second research question aims to understand what factors investors consider that render small companies to have low investment appeal. In other words, are the odds against small companies? This chapter collates the actors' perspectives to understand the investment outcomes identified in the previous chapters.

The discussion is structured into two categories: endogenous and exogenous factors. Endogenous factors discuss the intrinsic characteristics of a potential investee (energy company) assessed by an investor. Exogenous factors are extrinsic factors outside the control of the potential investee that influence an investment decision. These two factors are important because although intrinsic factors are vital, exogenous factors can, and do, equally affect investment decisions.

The chapter begins by discussing the intrinsic factors evaluated by investors and then moves to the extrinsic factors. The intrinsic factors identified in this research are financial

performance, personnel and management, business model, and company stage. The following exogenous factors are discussed: regulatory framework, capital availability and affordability, sustainability metrics, and partnerships and collaborations. This chapter addresses the second research question: What factors control investment decision-making in Kenya? This chapter reveals the logic and rationale behind the decision-making regarding investment selection that results in the investment clustering outcome discussed in the previous chapter.

6.2 Endogenous Factors: Firm and Project-Level Investment Assessment

6.2.1 Financial Performance

The financial vitality of a company is one of the critical factors, if not the most important one, considered during due diligence. At the core of each commercial investment, the decision to invest hinges often, if not always, on projected returns. Arguably, this is, by nature, the *modus operandi* of market (financialised) solutions. Hence, this factor is the singular emblematic indicator of a “financialisation-centric” development that privileges market solutions governed by neoliberal norms of profit-making operationalised by the permeation of private capital bolstered by funding from public institutions (Lai, 2025; Mawdsley, 2018). This section highlights that the current financing for climate change or development sectors and, in this case, the energy sector, seeks profitability as a primary prerequisite factor before (albeit not above) all else.

First, the investors reported that profitability, financial performance, and the owner’s financial contribution (to a project or company) are critical factors in assessing an investment. Most investors’ screening of investable companies included assessing profitability or its potential. In this research, all the investors stated they would only invest in profitable companies. Walter, a DFI director, stated the following:

“We are for profit. So, all our investments have to be financially sustainable (...) For the project itself or the company itself is the financial viability. Like I said, we need to make money. So, the economy has to make sense.”

(Walter, Regional Director-East Africa, DFI)

In support of Walter's point, another DFI investor, Patricia, mentioned that the DFI reviewees audited financial statements to assess profitability in reviewing a prospective investee.

"We look at your audited financials at least for the last three years. And hopefully, you should be profitable."

(Patricia, Investment Officer, DFI)

Second, profitability is not the only financial metric upon which these companies are assessed; general financial performance is also analysed to determine a company's financial position, including liquidity, debt levels, revenue or earnings, asset ownership for revenue generation, and a good balance between assets and liabilities. Retrospective and prospective financial performance are analysed to determine investibility. Shaun stated that a company's performance is benchmarked against predetermined financial ratios. Although companies may not always meet these benchmarks, if the investor selects them for the investment, the formulated contracts may stipulate they should work towards reaching those thresholds.

"In the primary and underwriting criteria of the company, we do look into the financials, and certain ratios have to fall within the threshold of the criteria. So, sometimes when they are not meeting those, we put in the financial covenant with them that they have to work upon certain things and ultimately be able to meet them so that they get a better financial position when they meet those ratios."

(Shaun, Investor, Impact Investment Fund)

Investors also analyse balance sheets to understand the balance between different types of capital. In particular, debt providers assess equity capital in a company to determine whether they will offer their debt capital to the company.

"I think there are a couple of things that you know as a lender; I would say there are three things. One is that the companies need to have a strong enough balance sheet that you need to invest. They need the equity capital to form that foundational capital that can then be leveraged to borrow

debt.”

(Miles, Director, Investment Firm & Fintech Company)

In project finance, prospective financial performance is a key consideration, and its assessment hinges on its assets and projected future earnings. The rigour of such assessment is also important. Project finance is often provided for infrastructure construction and operations of energy facilities to IPPs (Klagge and Nweke-Eze, 2020). In this case, prospective future earnings and the possibility of receiving that revenue are key influencers in investment decision-making.

*“With project finance, it is a lot more multi-faceted, because the strength and the value of what you are putting on the table is down to the asset; it is down to the strength of cash flows. (...) **Finances are important**; the robustness of your projections as far as cash flow goes is vital.”*

(Zuri, Investment Officer, IFC)

The third key factor is the company owner’s equity contribution to a company, used as an indicator of the risk the company owners are willing to bear and a signal of the owner’s commitment. High owner-contribution boosts investor confidence due to the risk distribution and sharing. Walter highlighted that he would not invest in a company without substantial investment from its owners and a fair risk-and-reward distribution.

“Their skin in the game (...) or how much they invested in the companies themselves. (...) developers are being greedy. So, in the sense that they do not have skin in the game or have invested almost nothing, they have very limited financial investment, but they want to keep all the returns. So, the structuring or the way the project is structured or the expectations of the developers in terms of risk reward or risk allocation. So, they want to push all the risk to investors (...), which does not work.”

(Walter, Regional Director-East Africa, DFI)

Another DFI investor, Patricia, echoed the same sentiment by providing an example of a recent investment assessment for a hydropower plant. She stated she was delighted the company had invested US\$4 million since it is important to her organisation that the potential investee has significant stakes in the project.

“financial capacity to provide some equity. (...) Can they provide equity? So, like this hydro company, they’ve already provided equity, like four million dollars, as their own money as part of the equity. We are happy that at least it makes up their own four million. (...) We want the company to have skin in the game.”

(Patricia, Investment Officer, DFI)

Financial factors, such as profitability (or its potential), capital structure, retrospective and prospective financial performance, and the owner’s stake in the company, are key considerations when deciding to invest. The findings in this section emphasise that financial viability is a rudimentary and significant consideration when assessing an investment; everything else is secondary and additional. This point is in line with Mawdsley (2018), who observed that the financialisation-development nexus has deepened financial logic, instruments, and actors in development. Equally, Bougrea (2024, p. 12) highlights the same issues as a “financialisation-centric” development, which has transformed traditional humanitarian aid approaches to investment strategies with a “private-turn”, introducing “private profitability into ‘development’ policy”. As discussed in this section, a company’s profitability is key to accessing capital, and the expectation is a consistent achievement of profitability post-investment. Furthermore, financial logic has penetrated the development agenda, including energy access and transition. This point further highlights the permeation of financialisation practices in the development sector.

Andrew, a venture capitalist and equity investor in Kenya and Rwanda, explained the importance of financial viability and the importance of the people running the company. He introduced the other key factor of consideration: company management.

“Ultimately, we are looking for a company that has unit economics that can justify the idea that they can be on a path to profitability (...) It is more that we screen companies and we really like them, but we feel like there is not a path to profitability there or that there is not the type of leadership that we need to see in terms of the staying power of the leadership team might not be there. You know, growing a company takes a lot of commitment, so it tends to be that we will look at them from a diligence perspective and then say, look, the ability to execute is going to be limited, and that is something that is going to preclude us from investing.”

(Andrew, Managing Director, Venture Capital Firm)

6.2.2 Company Management

Leadership and management are integral to a company's success (or lack thereof). This section discusses the second endogenous factor: company management. The discussion examines the struggle of companies having the financial resources to hire talent and its effect on fundraising outcomes. The research found that a company's management is a key consideration in investment decision-making and that investors assess its existence, strength, experience, reputation, execution capacity, and commitment.

The investors believed a company's management fosters its growth, and its future is only understood by assessing the management teams. Walter mentioned his assessment of the management teams ascertained their technical, regional, and sectoral experience, as well as their credibility, reputation, and commitment through their own investment in the company. Since the majority of companies are small start-ups, most of their management tends to be the founders. This assesses a team's knowledge, academic and professional credentials, and track record.

"The credibility of the people behind the company and the project, the experience, their reputation. Their skin is in the game. You know how much they invested in the companies themselves. What kind of track record do they have in that kind of technology, sector or region? Those are very important."

(Walter, Regional Director-East Africa, DFI)

Another investor echoed this sentiment, stating that a developer (or a company) must provide historical evidence of securing clients and effectively implementing projects.

"As a developer, you've got to build a track record, sign people, show that your product works and that you can actually close deals and get solar on the rooftops."

(Arnold, Investment Director, Impact Investment Fund)

Investors also investigate management teams to unveil any existing corruption, fraud, or bad reputation cases.

“It has to be well run from a management perspective to have some experience and some execution capacity and showing some real growth...we look at fraud and corruption-type issues.”

(Andrew, Managing Director, Venture Capital Firm)

Given the unanimous response from all the investors that management is an essential part of investment analysis, it is bleak to find that companies lacked the financial resources to hire the needed talent to access capital from the ecosystem. One of the recurring personnel needs for energy companies was the ability of companies to afford a CFO. In the previous chapter, while discussing the responsiveness of capital, such as grants, to the needs of companies, one of the investors, Eloise, echoed this point. She highlighted that CFOs build policies and structures that help in fundraising. She elaborated on this point by describing her conversation with another investor at the MIGA, who explained that the lack of key personnel to help a company organise its documentation leads to failure in receiving investments.

“So, so paying for team costs would make a huge difference, like being able to have a CFO who could help think through like the financial structure of the project financing, but also just raising money from inside the team, certainly someone around you knows compliance and reporting, and even just know building out their internal IT systems and their filling, because you know there is a lot of that (meaning challenge). I was talking to someone from MIGA, the guarantee organisation; she said it is very difficult for them if they are trying to provide a guarantee for a company and they cannot find their licensing or they cannot find the regulatory documents. You know, because it might be two years later and there is all this documentation, and it is a lot. She said it is very simple, a bit basic, but having the proper filing system as you are doing the work, these files go here, so whenever you need them, they are just right in place. A lot of the mini-grid companies are first-time entrepreneurs, you know; they are quite inexperienced. (...) if there's not money to hire skillsets and talent, then you remain in this unprofessional loop that we cannot get out of.”

(Eloise, Investor, Philanthropic Foundation)

Strikingly, the research also found that the financial challenges of hiring key personnel, such as CFOs, were more prevalent among small- and middle-sized companies (seed

and start-up stages). The low capital access factor for small companies highlighted in Section 5.5.2 revealed that start-ups and seed-stage companies accessed <21% and <6% of all capital across all financial instruments, respectively. A meagre portion of capital access competing with other urgent needs results in a struggle to acquire valuable team skills. Miles, an investor, elaborated this point as follows:

“Looking at a lot of these smaller and medium-sized distributors (meaning off-grid solar companies), they almost universally face some kind of skills gap. It varies by company; the severity of it varies by company, but there are certain critical capacities that a company needs when an investor is making their valuation. Right? And I would say two big ones are just corporate finance. So, having a strong CFO or, if it is a smaller company, a finance manager who can produce quality financial statements and give investors confidence that the finances of the company are being well-managed and that the reporting is all accurate and digestible. That is something that we see as a frequent challenge for these companies.”

(Miles, Director, Investment Firm & Fintech Company)

To bolster this finding, Edward, an impact manager in a scale-up stage off-grid solar company, explained that small companies may sometimes lack the structures or essential documentation to apply for funding opportunities, even when they qualify, highlighting the prevalence and severity of these issues for small companies.

“The second problem is knowledge in terms of applying for these opportunities and having structures in place for one to qualify because you find that the opportunities are there, decent opportunities. Let us say an NGO or a community group can qualify for that opportunity, but they do not have basic things like company registration and KRA (Kenya Revenue Authority) number, so those kinds of small details and the lack of maybe training, the lack of support or having these small organisations registered and taken through the process. That is a big problem.”

(Edward, Impact Manager, [Scale-Up Stage] Solar Off-Grid Company)

Moreover, although technical, academic and professional qualifications are necessary, they are not sufficient; hard and soft fundraising skills are equally important. They ought to demonstrate they can appeal to international investors while maintaining a deep local knowledge for effective company operations in Kenya. Therefore, it is not

only about what they do but also who they are. Andrew explained this point as follows:

“You’re looking for folks that have the experience in their own country, live in Kenya, and around elsewhere, know how business works, are able to see how it operates, and have the ability to see that they can really scale their business. And it is a combination of being able to talk the language of local delivery together with sort of more international finance, if you like.”

(Andrew, Managing Director, Venture Capital Firm)

Unanimously, the investors were interested in the potential investees’ existence and the calibre of the management team. Management teams must have dynamic skills and experience with investment appeal and successful business execution in local markets. Although limited literature has focused on management team characteristics influencing access to capital, class (networks, education from abroad and social capital) and having an international are some factors identified as helping investors, such as venture capital firms, to provide the lacking capital (Mkalama and Ouma, 2024; Jaoui and H.F., 2022; Jilltoft and Westman, 2017). This point agrees with the finding that management factors are essential to access capital. Most importantly, managers and founders must have a global outlook and a high social status to provide capital or demonstrate their “skin in the game”. Notably, these skill gaps are more prevalent in small companies (seeds and start-ups) than in larger companies, a factor that supports the finding of strained financial resources in these companies discussed in the previous chapter, restricting the ability to hire key personnel, such as CFOs. This issue is a cyclical problem; the lack of key personnel makes these companies unable to fundraise effectively, and consequently, they cannot hire the required talent, leading to the unending “unprofessional loop”, as one of the interviewees stated. Small companies experience stifled growth at a sectoral and national level, with less chance of scaling beyond the start-up stages, exacerbating investment clustering and the limited investment universe. Thus, the same players dominate Kenya’s energy market.

6.2.3 Business Model

The third endogenous factor considered in investment decision-making is the business

model. A business model encompasses profitability strategy, structure and intended development impact. Certain elements are assessed: target customers, growth potential, scalability, company structure, market size, and competitive advantage over other companies. A business model review analyses the scalability of a company's product using the current customers to determine the growth boundaries.

Patricia highlighted what she looks for in a company:

"We also look at the business itself: What are they doing? Who are the customers? Also, the market... how does the market look globally and regionally, and what is its growth potential? What is their competitive advantage?"

(Patricia, Investment Officer, DFI)

Although Patricia focused on a company's scalability and growth potential, others were interested in the technology composition of their business model. Shaun highlighted that, because of the strict investment mandate, his company can only invest in specific technologies, and most of the investee companies' revenues must come from approved technologies and business structuring.

"There can be some companies involved in more than two or three things, but at the same time, because of the mandate of our fund, we look into the revenue percentage of those companies. So, we would like them to have at least 50% or more from the solar sector, the minigrids or the clean cooking side."

(Shaun, Investor, Impact Investment Fund)

Shaun added that assessing the operational viability of a company's business model is important. He also highlighted that some of the large companies they have funded, in addition to many other investors, are not operationally viable. In other words, such companies continuously rely on annual capital-raising without effectively managing their expenses and generating sufficient revenue that can be reinvested in the company. Shaun believed this situation may lead to the collapse of some large companies.

"I think the overall industries might have to grow in a more progressive way, because there can be two companies of the same size, but one of them is burning a lot of cash by getting money from

*investors, and the other is more operationally viable. So, the operationally viable company is going to create much more long-term impact for the industry, as well as in terms of impact numbers. (...) In terms of industry, as I told you, they have to do better to grow the sectors. They first have to have operationally viable models. Some companies start with the thinking of getting a lot of funding, then they keep burning the money, and then they keep getting funding every year because those are pretty big companies. Different impact investment funds and organisations keep giving them money because they are creating huge numbers, like they have a lot of customers, a lot of revenues, and everything. **Ultimately, the net income is not coming in because they're burning a lot of cash.** So, those are the sorts of companies that I think are not viable in the long term, and we have seen a few such big companies go down. So, yes, all of the sector has to be much more viable, and then more money is going to come in."*

(Shaun, Investor, Impact Investment Fund)

Some large scale-up companies absorb significant capital to their balance sheet, meaning corporate financing is almost to the point of insolvency, so some have opted for innovative means of project finance and SPVs to raise finance. Companies usually use two standard financing forms: corporate or project financing. The former involves investors assessing the entire company's financial position, evaluating its equity and debt. Companies raising financing against their balance sheet means the company assets are collateral against default, and the repayment of debt capital hinges on the overall company performance (Klagge and Nweke-Eze, 2020). The other financing structure commonly used to finance energy companies is project finance (Bridge et al., 2020). In project finance, a parent company often establishes a subsidiary company, a separate legal entity often known as an SPV, which can receive investments directly from investors, acquire assets and transact with the parent company and other institutions. As a separate legal entity, SPV financing (equity or debt) is not reflected in the parent company's financial books. Hence, this approach is considered a tool to keep certain company activities off the balance sheet of the parent company. Due to this structuring, SPVs have been used to finance some large energy infrastructure projects and the mini-grid sector (Bridge et al., 2020; Klagge and Nweke-Eze, 2020). Some companies have adopted this model to raise funds for their projects.

Jack, an energy developer specialising in building solar minigrids, explained that his company has used the project finance model to build and sell assets; however, they planned to shift to corporate financing.

“So, previously, what we would do is partner with financiers such as CrossBoundary and others in the sector, and we pioneered the model of creating special purpose vehicles [SPVs] that you could build assets into and then sell to developers like CrossBoundary and be able to purchase new assets. So, that was our model for a while. I think it is evolving now; we are moving more and more towards raising capital on our own balance sheet and then building the assets and owning them and then generating revenue from electricity sales, as opposed to generating revenue from the sale of the assets itself and then also contracting with the new owner of the assets for a sort of operational maintenance contract. All that [is] to say that if we were to deploy a new project in Kenya now, we would fully finance the construction of the project in-house and then sign a PPA [power purchase agreement] with whoever we were building the assets for.”

(Jack, Energy Developer, Solar Minigrids)

The project financing model in the minigrids sector is key, since it also determines the investibility. CrossBoundary, an investor and developer that has bought assets from Jack’s company, explained the importance of a general company having an SPV in which they could invest directly in the operations of a single project instead of financing the general operations of the entire company.

“You, as a developer, do you hold them [assets] separate from all other ongoing activities in your company? So, you hold them in a separate SPV or company that’s not mixed up with all the other things you could have going on. Maybe you are running a solar home system on the side. You’re also running maybe a commercial and industrial use business on the side, making sure you’re not mixing it with your other operating costs. The minigrids that you own as a developer are within a separate company. Then, it’s easier to finance. It’s easier for us to step in and finance just the minigrids because if we’re dealing with a company and so many other things going on, how then do we separate and say we are specifically financing minigrids? So, that’s also one of the criteria.”

(Linda, Associate Director, Investment Company)

Although the use of SPVs dominates project financing, more off-grid energy companies, especially those who have received a lot of financing from many investors, are shifting to the securitisation of their “future revenue receivables” from customers through SPVs. Edward, an impact manager at one of the top five funded off-energy companies, stated the company had raised financing through SPVs. This point aligns with Baker’s findings, which illustrate that the sector has new emerging financialisation through the securitisation of PAY-GO SHS loans to customers, which are bundled together as securities and sold to an investor (2023). Baker drew these conclusions after observing BBOX (one of the top five funded companies) creating an SPV and bundling customer receivables into Kenyan-shilling denominated asset-backed notes to Oikocredit. In 2025, the CFO of d.light published an article highlighting how securitisation became the capital lifeline during the COVID-19 pandemic as investors increasingly became risk-averse and withheld their capital from Africa. The article details that the company effectively raised US\$500 million through securitisation, funding its growth into new markets and fully paying back lenders in its first securitised facility, BLK1 (Pfende, 2025). The article outlines the benefits of this method through the use of SPVs. First, this approach provided a lower cost of capital, since the customer receivables backed the credit provided; second, the deals made through local currency shielded the company from the foreign exchange risks; third, it is less risk for the lenders; and fourth, it favoured existing investors, since there was no dilution (Pfende, 2025). Regardless of whether these companies are moving toward securitisation due to a reduced investment appeal or increased risk aversion by investors, this further demonstrates the increased financialisation of the sector, with financial logic increasingly permeating the practices of energy companies. This further reveals how this emerging method of capital-raising favours large companies with large market shares that can be leveraged into securities. Figure 16, below, illustrates the securitisation process of customer PAY-GO SHS loans.

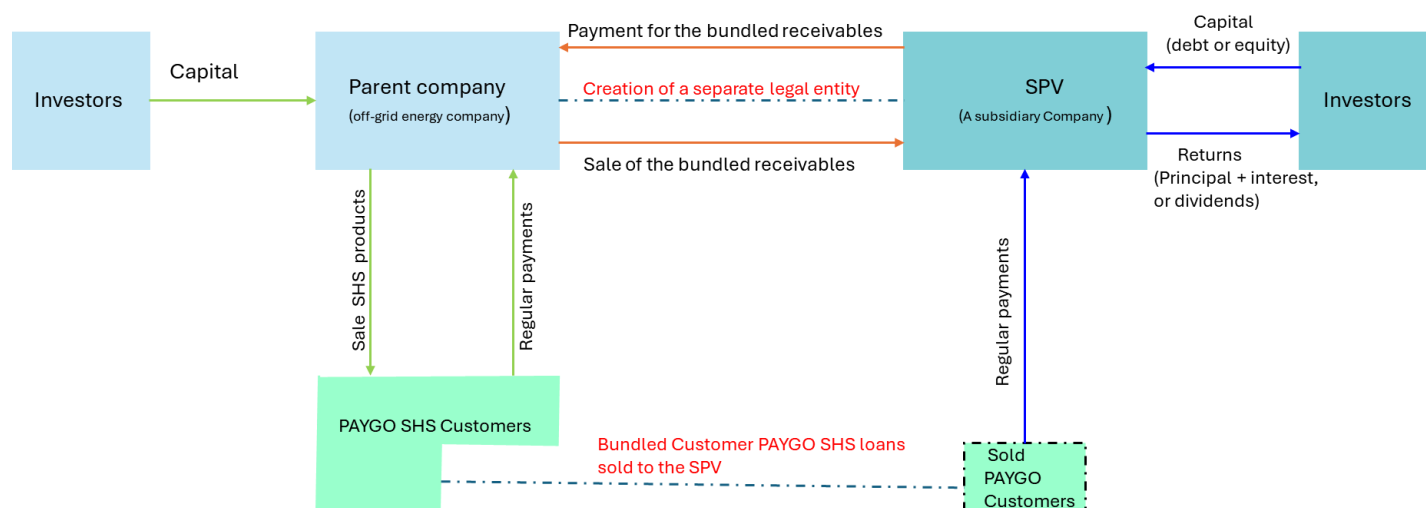


Figure 16: Securitization of PAY-GO SHS Loans Using SPVs

Figure 16 illustrates the risk delimitation vehicle, which allows the investors of the SPV not to be mixed with the parent company. Therefore, an SPV is considered a risk-reducing mechanism for creditors, which often reduces the cost of capital, because their returns are not determined by the earnings of the overall company but based on the collectables from the selected bundled receivables. This strategy is becoming common. Walter stated that his company works with other companies to create SPVs to attract investments.

"We are partnering with commercial banks to create these off-balance sheet structures that then allow the solar companies to remove the receivables from their balance sheets and pack them in at SPVs that then allow investors to invest in, allow[ing] them to create more space to generate more receivables by selling more SHSs."

(Walter, Regional Director-East Africa, DFI)

Another critical part of a business model is market size, which is vital in determining the future earnings of a project and the company's revenue. For investors, this determination is to assess the return on their investment based on both the characteristics and the size of the market. Jack outlined that building minigrids must make business sense. Commenting on mini-grids criticisms of small market size, Jack said the following:

“The point is that if you are trying to build a mini-grid for 50 households, then that criticism is a very legitimate concern, right, because it’s very clear how you’re going to be able to recoup the capital investment to serve that community, and that community is probably really bottom of the pyramid, like really, really impoverished and incapable of finding enough value from the access to an activity to make it worth their while to pay enough to recoup the cost. It’s very different if your mini-grid is serving 3000 households with probably 15,000 individuals in them, right? You have enough of economic vibrancy and a mix of customers to make the numbers work, and that’s why we don’t build household grids like that, because we focus on trying to unlock a profitable model for delivering reliable portable fuel electricity to people.”

(Jack, Energy Developer, Solar Minigrids)

Understandably, regarding Jack’s concerns (small market sizes), Susan highlighted the threat of mini-grid models in countries such as Kenya, where, she stated, the government, through its last-mile connectivity programme, is connecting Kenyans to electricity. Therefore, not only would a mini-grid company worry about market size, but it would also compete with government electricity connections in certain areas, creating the challenges of market size, competition and return on investment, since PPA on average are 15–25 years.

“Kenya – across Eastern Africa states, we are strong in terms of infrastructure, quality and reliability, and we are now working on access. So, when you look at doing a mini-grid and you a feasibility study, and, for instance, you want to do one in Kitui, you can be sure in the next five or 10 years the government will be very close to your mini-grid, if not within your grid area.”

(Susan, Design and Construction Engineer, KPLC)

6.2.4 Company Stage

This section discusses the fourth endogenous factor: company stage. This factor is a proxy for company size and further illuminates whether company size or stage affects access to capital. This research found that most actors (investors) providing capital in Kenya’s energy market preferred investing in mature, growth-stage companies and, in the case of projects, those that have completed the development stage. This point

corroborates the descriptive analysis in Section 5.5, which found that more than 80% of Kenya's investments went to large companies. The investors stated they did not finance small companies due to the following reasons: poor reporting practices, preferences, risk management, and the general scarcity of capital for small and start-up stages in the energy market.

Shaun, an investor, highlighted that although his fund is approached by small companies for financing, the reporting struggles that plague many such companies due to resource constraints may disqualify them from receiving an investment.

"Some of the companies that might approach us are slightly smaller, and the problem we face is that, sometimes, they do not report the information properly. So, once we know about the real picture of the things, that they do not fall into our criteria, those are the main obstacles in us not being able to fund the companies."

(Shaun, Investor, Impact Investment Fund)

Another investor, Patricia, stated that her organisation prefers to invest in scaling and mature companies, not start-ups: *"We do like the scaling and the mature (companies), but not start-ups."*

Similar to corporate financing, which assesses the entire company, project financing, which targets a particular project, perhaps financed through an SPV, was also skewed towards projects that have completed the development stage and, at times, moved beyond the construction stage. Walter, a DFI investor, highlighted that, no matter the technology, his organisation does not provide early-stage investments. For example, to invest in an IPP company, the company must have completed all the development stage activities and even obtained a PPA with an off-taker, such as KPLC. This situation guarantees that once you produce power, you have a ready buyer, which lowers the risk for the investor.

"(To invest in) geothermal – they have executed PPA, and you get the power and are looking for financing partners. We do not get involved in project development. Those kinds of early stages of the investments. It applies across all technologies. So, we do not do project development. (...) If it is a connected project and there is no PPA with Kenya Power (KPLC), say if the government

has not provided that, then there is no point being in it."

(Walter, Regional Director-East Africa, DFI)

One IFC investor recognised and admitted that despite their preference and criteria for investing in large projects, few projects qualify. This is because many projects have to go through the development stages of conducting feasibility studies, technical studies, community engagement, PPA negotiations, and community engagement, amongst many other activities (Klagge and Nweke-Eze, 2020). These are the riskier stages of a project, and investors want to invest after they have been completed.

"(...) It would be difficult for us to consider projects that have a financing need that was below \$20 million. (...) With that would come the requirement for feasibility studies to have been completed and technical studies to be completed. Some of the permitting would have to be in place for the IFC to consider that project. (...) There are not that many investment-ready, 20-million-dollar projects in the market. And I think that even our business model has evolved. "

(Zuri, Investment Officer, IFC)

Capital is scarce for early-stage companies or projects. Most of the capital flows to Kenya are from commercial funders looking for mature, scalable and growth stage companies. This situation partly explains why most of the financing flows to the few large companies meeting their investment criteria.

"There is a lot of capital that comes in at the growth stage and above, but there are few players in the early stage, especially once companies have exhibited proof of revenue generation. Typically, there is a struggle to attract capital to scale these businesses to a level that gets to the growth stage that now can be the bread and butter of commercial funders. We are just coming in to fill in that gap."

(Garry, Investment Officer, Private Equity Firm)

The company stage determines the ease or difficulty of accessing capital. First, being a small company signals more risk to an investor; hence, many prefer investing in large companies or projects at an advanced stage. Second, there is less capital in Kenya's energy market that focuses on funding small companies. Third, poor reporting capacity

or practices at small companies due to resource restraints also deter many from investing.

6.3 Exogenous Factors: Sector/Industry-Level Factors

6.3.1 Regulatory Framework

A country's legal and regulatory framework is necessary for the operation of markets. They are effective enablers of market creation and mobilisation (Bonizzi, 2013), and they signal the political will of regimes to tackle development issues. Section 4.2 argued Kenya moved from the 'capital paucity' stage to the 'capital growth' stage, as the country fulfilled the regulatory reforms requested and funded by international public investors, demonstrating the influence of policies on access to capital.

Despite Kenya's progress in energy regulation reform and subsequent increased capital access, which many actors attributed to the country's formulated policies and strategies, different subsectors have niche policy needs that may still need to be addressed. Policies, or lack thereof, determine where energy companies operate and where investors invest their capital. Moreover, where policies exist, a stable regulatory environment encourages capital access, whereas uncertainty and volatility constrain it.

Jack, a project developer, highlighted that policy is key in selecting a country for their operations. Headquartered in Kenya, his company has struggled to operate in the country, citing a lack of regulations that would provide the company with a framework to build and operate minigrids. Related issues have dissuaded the company from working in other East African countries, such as Tanzania and Uganda, and, currently, their primary market is in West African countries, such as Nigeria. He stressed that Kenya has delayed formulating regulations to solve the uncertainty of what happens to a company's infrastructure when national utility grid infrastructure arrives in areas operated by private developers, adding risk to investors' existing fears of recouping investments given low-income target customers.

"Now, we actually exited Tanzania. Tanzania used to be the golden child of the sector, with the best regulations copied from Nigeria. Then, they woke up one day and decided not to enforce the regulations, and that destroyed the business in Tanzania. Many developers pulled out of the

*country, including us (...). And so, Tanzania is, I would say, not a good market for the private energy sector, and we have abandoned that market. Kenya has been stalling the passing of the mini-grid regulation for close to more than half a decade now, so it's always been just around the corner, but it's never come through. And without that regulation, there is really no framework for people like us to operate. Even though we are a Kenyan-headquartered business, most of our growth is now in West Africa (...). I always say there are three ways to be bad in terms of regulation. First, no regulation, right? **Because you can do whatever you want tomorrow. Somebody can show up and say that what you're doing cannot be done anymore.** Two, is to have **bad regulation** that does not allow for private sector participation. And then three is to have **inconsistent regulation** and regulation that you cannot rely on for the life of the assets that you're building."*

(Jack, Energy Developer, Solar Minigrids)

The lack of a consistent regulatory environment poses additional risks that dissuade investors from providing capital, or they price the risk and provide expensive capital. Hence, investors and developers must perceive a stable policy environment to boost their confidence, because these infrastructures are costly and have a long lifetime.

"Because it's a very expensive asset to build, and investors get quite nervous about funding something that expensive that is meant to be there for the next 20 years when the (national) grid is very close."

(Eloise, Investor, Philanthropic Foundation)

Although KNES articulates different electrification pathways, including minigrids and the national grid, Kenya has not formulated and implemented policies that delimit markets for these pathways or stipulate infrastructure integration (MOEP, 2018).

Jack confirmed there is uncertainty about what happens to the assets of a private developer when the grid expands to an area operated by a private developer: *"What happens to your assets? That means there needs to be a clear articulation of what is expected when the grid arrives in an area that's being served by a private operator."*

This experience is not unique to the mini-grid subsector. Other subsectors, such as clean cooking and the off-grid SHS businesses, have faced related policy issues. Andrew, an

investor, stated that investing in Kenya feels difficult because, each year, his portfolio of companies faces annual VAT tax uncertainty on their products. This tax significantly influences the cost of the products, many of which target low-income HHs and rural communities. Having target customers with a lean margin of purchasing power means that annual VAT tax changes significantly affect the companies' sales and, most importantly, the ability of companies to predict their revenues, and this volatility dissuades capital investments.

*“So, first in Kenya is regulatory certainty, right? You know, the back-and-forth that we sometimes get around policy issues, is a VAT on the products of our companies or not? And that back-and-forth is very damaging. So, we need a lot more regulatory certainty. [...] You need to make the investment environment as stable as possible. (...) **And at the moment, it feels like it's actually very difficult to invest in Kenya .**”*

(Andrew, Managing Director, Venture Capital Firm)

One of the companies affected by this issue is a clean cooking company that continues to lobby the government to forgo taxation so they can provide products to low-income households. Sylvia explained that they continue to struggle to raise capital since most investors insist they will only provide capital when they have an investment agreement with the government for tax exemption, because investors want to fund the expansion and operation of the companies and not tax payments. She offered an example of her company receiving an investment agreement from the Government of Rwanda, giving them a 10-year tax exemption. The company wants similar support or certainty on VAT taxes in Kenya. Hence, the annual tax uncertainty dissuades capital provision and, most importantly, increases capital costs.

“As we import more cookers and more ethanol because the local industry is not robust, it means you're spending more and more money paying taxes, money that could be used on us expanding, getting into more and more towns. (...) So, given that we are fundraising, you want to be able to tell the investors that the money is going towards expanding, not into government coffers. So, [with] that uncertainty, you are not able to project how much of the money raised will go towards the government.”

(Sylvia, Group Head of Public Affairs, Off-Grid Energy Company)

Policy instability affects the amount of investment flowing into a country, the speed of capital disbursement and its cost. This situation is partly confirmed by one of the investors who responded to the question of how this volatility affects capital access.

"Investors are not sure. So, it's a weakness. (...) So, as an investor, you don't know what you're getting into. So, I think, from my perspective, that does affect the speed of investments and the amount of investments going into investments and the projects being executed and the quality of those projects."

(Walter, Regional Director-East Africa, DFI)

Despite the general consensus among the energy companies and most investors, contrary opinions arose. One investor highlighted that although good regulation encourages them to invest, they always find a way to invest, even with a volatile policy environment.

"Look, I am a transactor, right? We do deals (capital investment) because of good legislation but also despite good legislation."

(Zuri, IFC, Investment Officer)

A few interviewees thought that all policies existed and that the most significant challenge was slow access to finance, because only a small number of investors provide large amounts of financing. Moreover, without achieving the agreed-upon investments, investors are reluctant to provide subsequent funding.

"Surprisingly, all policies exist. It is just that access to financing is slow, not that it doesn't exist, but it is slow because, as I mentioned, see, if you financed me for phase one or phase two, your hope is that you are already seeing returns before you can finance the next phase. And the reality is that we have very few financing institutions because of the amount of money that is needed (...) So, if you've not realised your return as you had hoped for (...) the chances of you giving me more funds will be there but will be slow in the sense that you will introduce other parameters for me to meet maybe in the next phase before you can finance. So, in my opinion, the policies exist. The challenge is on how do we get more financing?"

(Susan, Design and Construction Engineer, KPLC)

Formulating the necessary policies and ensuring stability are imperative in fostering investor confidence and mitigating risk to increase capital access. Effective capital-raising is only realisable with supportive policy frameworks. This finding agrees with other studies that have recognised the effect of capital access on the energy sector in Africa and Kenya (Fields et al., 2023; Osano and Koine, 2016; Baumli and Jamasb, 2020). Policy formulation, effective implementation and predictability should be considered risk mitigation strategies in emerging markets, because these affect the amount of investments, the speed of capital flows and the cost of capital. The goal is to boost investor confidence, and, given the disadvantaged position from which countries such as Kenya begin with a high-risk perception, it is key that the policies and implementation are consistent and reliable.

6.3.2 Capital Availability and Affordability

Kenya relies heavily on capital from international investors. Both global and national macroeconomic headwinds may affect the availability and affordability of capital. The quantum of capital accessible to energy companies in Kenya is contingent on and directly correlated to the amount of capital flows from international sources to investment firms. Furthermore, the investment appeal of companies based on previous returns in emerging markets influences investor willingness to provide capital. Although this section does not discuss broad macroeconomic effects, it bases its findings on the actors' experiences in fundraising to bring capital to Africa and invest in energy companies. The two key issues discussed are capital availability and affordability.

6.3.2.1 Capital Availability

The amount of capital available for investment depends on the capital provided by investors. The actors had mixed views regarding the ease and availability of capital to FIs. Some interviewees claimed investors are currently more averse to investing in Africa, whereas others stated investors were eager to be part of the energy access story in Africa.

Figure 17, below, illustrates capital flows from international sources to energy companies in Kenya. There are two distinct stages: Fundraising Stages I and II. In the first stage, FIs, such as venture capital (VC) firms, raise funds from public investors, private institutional investors, and others. Once these FIs receive this capital, they create a fund. The second stage is when energy companies fundraise capital from FIs. If successful, the companies receive capital to fund them. At times, there are direct investments from public and institutional investors in an energy company.

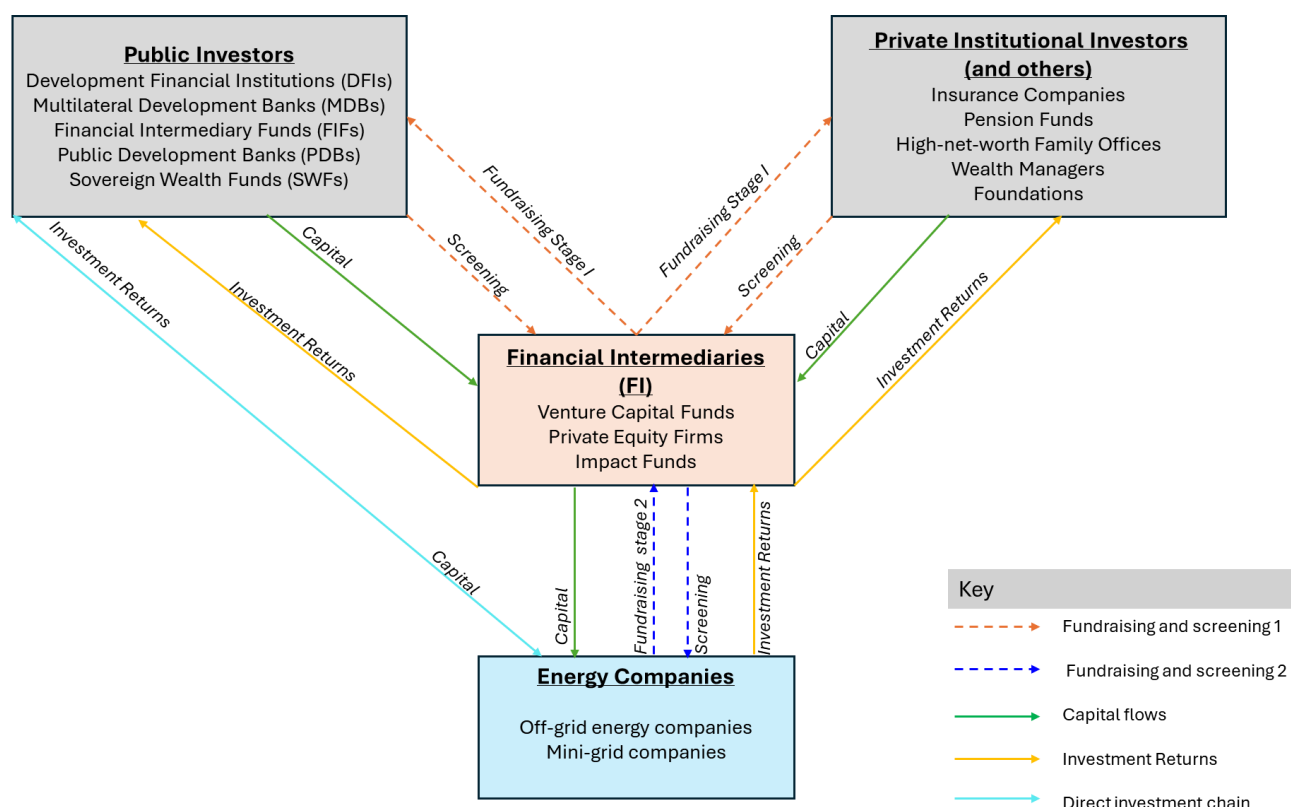


Figure 17: Fundraising Process and Capital Flows (illustrative purposes only)³⁵

The amount of capital that flows to companies during Stage II is contingent on the amount raised in Stage I. This is a key factor that influences access to capital. This section highlights FIs' experiences in raising capital to build funds that invest in energy companies. The discussion considers how this sourcing affects energy companies' access to capital.

Andrew, who was in charge of raising capital for his VC firm to invest in energy

³⁵ This diagram was created using the interview data – investor category.

companies in Kenya, stated that raising capital for Africa is a tremendous challenge. He highlighted that, because of macroeconomic instabilities and the increase of interest rates globally, *“Africa is low on the priority list”* of international investors who are now looking *“for the safe havens for their capital”*. As a result, he stated that 2023 was *“one of the toughest capital-raising environments that many people have experienced in their careers”*, and *“it’s very, very challenging”*, and that his company was *“finding it very, very difficult to raise funds on behalf of companies on the continent”*. He added that Africa had *“fallen down the priority list and is not being paid much attention by global finance”* because of poor returns to investors. He reported that global investors perceive Africa to be *“too risky in the returns”* from a macroeconomic perspective, and from the climate perspective, it does not *“offer the kind of impact that European and US investors are typically looking for”*. Regarding the former, the feedback is that Africa’s *“track record of returning capital to investors is very poor”*, meaning the *“quantum of returns is too low (...) the number of times that capital gets returned and type of returns”* have been unsatisfactory for the investors. Regarding the latter, investors think Africa’s *“impact per dollar isn’t as high as it can be”*, and it is better to invest in *“Australia and Europe or back in the US to transition out of coal and into cleaner fuels”* than in Africa, where companies offering solutions to move from *“zero energy to some clean energy seems much lower”*. Therefore, he stated, *“Africa has become increasingly marginalised”*, and the few investors interested would rather *“put their money in Asia”* or other emerging markets.

However, not all investors thought capital-raising was difficult. Shaun stated that, because his bosses are well known for operating a successful investment fund, and with their former professional ties, this good reputation helps them raise capital. Occasionally, investors contact them to invest in their fund.

“The partners, the CEO and other top management have a broad set of experience working on the investment impact side of things, and they have worked at the top of the world banks. And so all the investors know them from their previous professional experiences. But at the same time, as I told you, the ‘F fund’ is currently the biggest fund in the market. So, once you take on such big funds and difficult challenges, your reputation in the market goes up. And then investors, they

also approach you."

(Shaun, Investor, Impact Investment Fund)

Titus, a finance officer at 'Company Z', admitted that although he could not provide an industry-wide picture, his company does not face many challenges in raising capital because he believes the funded projects (minigrids) provide good returns.

"For Company Z, I don't think it's too difficult to raise financing. I think there are a lot of people who want to be part of the story and believe in the mission (...). They are (the assets) relatively stable cash flows and good investments. So, I think they offer good risk-adjusted returns. And yeah, so I don't think Company Z has much trouble bringing in capital. But yeah, I don't know. It's probably different from company to company. So, I couldn't talk for the whole industry there."

(Titus, Finance Officer, Distributed Electricity Utility)

The mixed experiences of the FIs in raising capital for Africa are worrisome. Given the high reliance on international investors and the aversion towards local ones, the attitudes of the former regarding the profitability of investments in countries such as Kenya determine whether they provide future capital. The proportion of investors averse to continue investing in Africa poses a challenge regarding reduced capital flow to Kenya. Capital affordability is another challenge.

6.3.2.2 Capital Affordability

This section addresses the issues of capital affordability. Capital provided to energy companies is expensive due to the high risk perception. This costly capital is provided in foreign-denominated currency (hard currencies) and, compounded by other global macroeconomic factors (such as inflation), becomes prohibitively expensive for energy companies. Hedging FX risk is expensive and sometimes difficult for these companies. Fundraising Stage I (Figure 17) illustrates FIs on a global stage, raising capital, mostly, if not all, in hard currencies. Hard currency examples include the US dollar, the Euro and British sterling. However, the funded energy companies operate locally, collecting their revenues in local currency. These local revenues are transferred into hard currency to pay the investment returns. Hence, providing the expected investment returns (of

costly capital) while managing the FX risk can be an insurmountable challenge for these companies.

The interviewees had a consensus that capital provided to the African region is expensive. Right from its sourcing capital, it is expensive. Andrew stated, *“the capital that comes to our region (Africa – East African region) tends to be quite expensive”*.

Boniface, an energy team leader at a research institute, said, *“fund managers are incentivised around making a return. And the foundations don’t want their core capital to face too much risk or reduce.”* He highlighted that the perceptions of risk in Kenya are sometimes *“real, and I think sometimes it is a perceived risk”*. Since the high risk (perceived or otherwise) is priced on the capital, it becomes more costly. Outside the cost of capital, at the sourcing stage, macroeconomic headwinds, such as inflation and currency devaluation, take a toll on companies during the capital return process.

Most (international) investors and FIs prefer to provide capital in foreign currency despite requests for local currency, because hedging FX risk is expensive, regardless of whomever this burden falls on, be it an investor or an energy company.

“We can do this (meaning investing) in hard currency, (...) but then we can also provide local currency, but we need to hedge opposition. We have a partner who provides us with the hedge, but then it becomes a bit expensive (...). So, we actually prefer to provide it in dollars or euros. (...) Most of the projects request finance in local currency (...). The only time they are okay with dollars is if they have revenue in dollars. If you have revenue in dollars, then you can only pay in dollars; it’s easy. There’s no mismatch. But then, if your revenues are in (Kenyan) shillings, you have to pay in dollars, and if the shillings depreciate, it becomes expensive.”

(Patricia, Investment Officer, DFI)

Remarking on the currency devaluation mentioned by Patricia, another impact investor, Arnold, reflected on how macroeconomic headwinds have led to the return of inflation in the aftermath of the COVID-19 pandemic.

“A return of inflation and all these other weird-like macroeconomic themes sort of hit everybody in weird ways.”

(Arnold, Investment Director, Impact Investment Fund)

The inflation meant interest rates increased. Patricia explained how this increase affects the affordability of capital.

"Now the interest rates have gone high. Our interest rates are benchmarked against the Secured Overnight Financing Rate (SOFR). On SOFR, we then add a margin to it. So, the problem is that last year (2022), SOFR was at 0.5% or less than one per cent. Now (2023), it is 4.5% or 4.8%, and we still have to add a margin. It then moves from 4.5% or 5% loan interest to 9.5% or 10% interest rate. So, that has become a challenge. (...) So, you end up maybe turning down some projects because now, well, because some companies can't afford it."

(Patricia, Investment Officer, DFI)

Small- and medium-sized companies struggle to manage the FX risk because it is outside the expertise of the company management.

"Companies struggle with the foreign exchange risk related to where they're getting their financing. So, in many countries, there's a lack of access to local currency financing, and generally, there's a lack of access to that capital. When you can find that capital, it's often denominated in USD or in euros or pounds. And so, for the lenders making those loans, they're trying to manage their FX risk and will often demand things like hedging (...), but that becomes very expensive. Especially for smaller companies that are just getting started to be able to manage that FX risk. It is very challenging; it is very expensive, and it is often beyond their own skill and knowledge base."

(Miles, Director, Investment Firm & Fintech Company)

Cate, an electrical engineer who formerly worked with a transmission utility company in Kenya, stated, *"One of the biggest risks in development finance is disbursements in the US dollar. The foreign currency risk is a very big risk to projects because when we have a small dip in the rates, the project goes topsy-turvy. Most of the time, money is lost doing index conversion."*

(Cate, Electrical Engineer, National Transmission Utility Company)

The comment above highlights the volatility of companies and projects relying on

expensive international capital sources bundled with FX risk, which could lead to failure or bankruptcy. A project developer, Jack, when asked about some of the key issues regarding capital access he would like to see addressed, stated the following:

“Local currency debt financing or some way [for] companies like us to hedge against that FX risk for foreign exchange rates. So, local currency debt enables us to match our costs with our revenues in terms of currency, which helps us hedge. (...) With the strengthening of the dollar and all the craziness around the countries defaulting on their debt, (...) there are really no good tools for companies like us to insure ourselves against these types of risks.”

(Jack, Energy Developer, Solar Minigrids)

6.3.3 Sustainability Impact and Metrics

Energy sector investments fall under the umbrella of climate finance and the achievement of SDGs. As formulated in SDG 7 – Energy Access, indicators are set to guide actors when measuring the goal's progress. One indicator is to track the proportion of people in a population with access to energy in general and those relying on clean energy sources. Hence, actors temporally monitor these numbers to determine progress but also evaluate their role in fighting climate change through avoided or averted CO₂ emissions. These reports are called impact reports. In addition, the actors were keen on reporting on ESG, whose metrics focus on corporate sustainability and ethical business operations, for example, tracking waste management, social factors, labour and working conditions, governance, board structure and diversity. In this context, the impact and ESG metrics are termed ‘sustainability metrics’. This section investigates how a company’s ability to document evidence and report on sustainability metrics affects its access to capital. This section demonstrates the flow of sustainability metrics from investors to energy companies, their effect on capital access and cost, and how small- and medium-sized companies struggle to report on these metrics, which affects their access to capital.

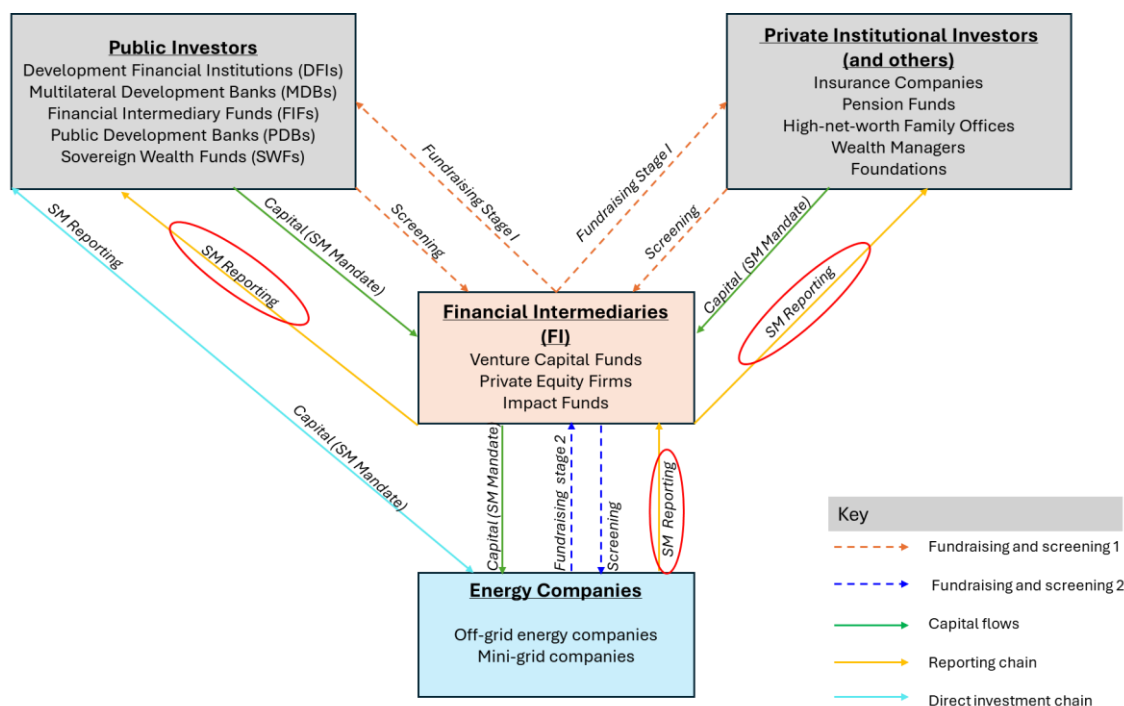


Figure 18: Sustainability Metrics Flow and the Reporting Chain (illustrative purposes only)

Investors are interested in the amount and the ability of an energy company to document, evidence and report on the sustainability metrics.³⁶ As a result, investors assess this factor during the screening (due diligence) stage. Sustainability metric mandates trace the same path as capital flows in Figure 18, which move from investors to FIs to energy companies (see the modified Figure 18).

Different FIs stated that these mandates were either strictly passed down or collectively constructed. Arnold and Linda explained this point as follows:

“So, we have requirements from our investors, theirs, especially if we are getting money from (DFIs) to go into our fund, (...) they have their own requirements. These are policy goals. There are things they want to see, things they want to report on and share with their stakeholders, national legislatures, parliaments, and so on that have been passed to them and directed them to say, ‘This is what we are achieving.’ So, they want us to collect that information. So, some of it is we need to be able to provide that information on up (...). Sometimes, there are discussions on

³⁶ Commonly, investors providing capital in Kenya for its energy generally wished to report on two key outcomes: the number of households with access to energy and the amount of carbon dioxide (CO₂) averted/avoided. Regarding ESG, this varied depending on the type of company. A list of many factors that investors highlighted included the following: e-waste policy and management plan, gender policy and action plan, labour and working conditions, occupational health and safety, stakeholder engagement, supply chain management, and data protection and privacy. In summary, the impact focuses on making the world better, and the ESG focuses on the company improving to be above reproach.

what the metrics are, but sometimes, there's just not a lot of room for negotiation. Our investors say collect X, so we are going to collect X. The golden rule sometimes applies: If you want the king's gold, you are going to follow the king's rule, (...) and we can't violate our investor agreements. And they told us (...) they'd invest in our funds and we would provide them that information."

(Arnold, Investment Director, Impact Investment Fund)

"We raise a lot of concessional capital. Concessional capital comes from the likes of AfDB and IFC, and literally, IFC is the benchmark for ESG standards. So, they come with frameworks that need to be trickled down to the partners that you work with. So, that is integral to our investment assessment. It's not an add on (...); it's every step of the way from the time that we are pre-screening."

(Linda, Associate Director, Investment Company)

All the interviewed FIs reported that the sustainability metrics were negotiable or strictly imposed depending on the investor. Once agreed upon, an FI passes this along to energy companies during investment. The FIs enforce the reporting requirements, so that energy companies can measure, monitor and report this information to them. As a result, the sustainability mandates flow from the sources of finance to companies, and the reports move in the opposite direction (see Figure 18).

Although investors are the enforcers, some actors felt that, in the long term, a collective belief in doing the right thing is better for achieving sustainability metrics.

"I think it should be coming from the companies themselves because it's the right thing to do. So, the company should aspire to do the right thing without being pushed by regulators or investors, because we don't like these companies doing things for us, and, as soon as we exit, they go back to business as usual, which is actually not compliance-driven. And the regulator cannot be everywhere. So, if it's regulator-pushing, then you can imagine that when the prefect is not in the classroom, it's chaos."

(Walter, Regional Director-East Africa, DFI)

The interviewed FIs highlighted that the importance of reporting sustainability metrics

is to demonstrate that the intended impact was achieved. Andrew, a venture capitalist, stated that their investors are keen to see that,

“Impacts are real and measurable, and there is no element of greenwashing or impact washing going on here.”

(Andrew, Managing Director, Venture Capital Firm)

To secure funding and support from stakeholders, an investor must demonstrate their impact quantitatively and qualitatively to encourage investors to provide initial or subsequent funding. Alan, a DFI investor, stressed that capital-raising is a political process, and to garner support and advantage, one must demonstrate measurable evidence and provide qualitative narratives.

*“We are funded by the Swedish Government. We think that if we can demonstrate the results and innovations, we can secure continued support from the Swedish Government actually to provide financing for our goal. Why do all of the strategies now include energy in Africa? I think that’s because if you can communicate them and use both the quantitative and qualitative narratives, it’s political in the end, so it is good to have that story to tell, and it’s easy. It’s much easier when you (...) **voluntarily collect quantifiable data**. Most colleagues in other programmes just sort of give some stories (...); it’s much more qualitative, which makes it harder.”*

(Alan, Investor, DFI)

It is equally important for energy companies to pursue, achieve, document, evidence, and report on sustainability metrics. Energy companies know that if they can articulate their previous impact and ESG achievements during fundraising rounds and reveal their improvement pathways, this is a tactful way of winning over investors, and, overall, it improves capital access.

“Actually, they’re the ones (meaning energy companies) who come to us, saying, I want to do this. Of course, they know what we want to hear, so they tell us. (...) For those that do well with ESG reporting and good impact, it does not just open up for them to get financing just from us; it opens up financing within the space in general.”

(Walter, Regional Director-East Africa, DFI)

The ease of capital access as a result of reporting sustainability metrics was further supported by Andrew, who directly correlated the quantum of capital flowing to the company with its ability to report on its sustainability metrics.

“The more an organisation builds evidence-based and measurable impact and the more financing; as a result, it encourages financial flows.”

(Andrew, Managing Director, Venture Capital Firm)

It is not just the quantum of capital that is positively impacted but also the cost. Depending on the investor, energy companies may receive capital at a low cost due to the company exceeding the set compliance for sustainability metric standards. On the other hand, punitive measures exist should companies not adhere to these standards.

*“Within our projects, whether an institution, an investee or a borrower, I expect you to operate within those standards. The standards are the baseline. If within those standards, that does not give brownie points for economic benefits, such as cheap finance, such as a loan with 25 basis points cheaper, you have to go above and beyond (...). However, if you do not meet this, your capital becomes expensive. (...) As an investee, you cannot come to the market and want to raise money that I am tagging sustainability. This will come with a carrot-and-stick mechanism. **If you meet the performance standards, if we charge 5%, we might charge you 4.75%** (illustrative numbers only), you can't come and tell us that you are seeking that type of financing and what you are committing to do is what you are expected to do anyways under the existing standards.”*

(Reagan, Principal Investment Officer, IFC)

Edward stated that his company collects these data to demonstrate their impact and secure financing from investors.

“If you have that data to evidently show people you have impact, it basically increases our chances. And that's why we record such things. Basically, for example, if I sell a solar home system to someone living in a rural area and they end up having light, that is an impact. It is not impacting one person but the entire household. So, definitely, we want this data; we collect it to ensure that it makes life easier in terms of getting investors or climate financiers (...). So, it is very important to measure these kinds of impacts, even for investors.”

(Edward, Impact Manager, [Scale-Up Stage] Solar Off-Grid Company)

Having established that a company's ability to report effectively on its sustainability metrics affects access to capital and, in some cases, reduces the cost, it is imperative to highlight the struggle of small- and medium-sized companies in meeting reporting requirements. First, as discussed in previous chapters, these companies have skills gaps because they struggle to raise capital and fund their teams, including sustainability teams. Reporting sustainability metrics is expensive in general but prohibitively so for smaller companies. Linda admitted it is costly to set up systems to report on sustainability metrics such as ESG.

"So, I wouldn't lie; the initial cost of making sure the ESG systems are in place and all of that is a lot."

(Linda, Associate Director, Investment Company)

Companies that rely on climate financing have no choice but to ensure they can report on sustainability metrics to access capital. Such reporting is an integral part of the selection process. Edward stated that a company has no choice but to invest some of its financial resources in hiring talent to assist in this reporting.

"If your company relies on climate finance, most of the financiers require such ESG reports. Sometimes, you have to invest some of your resources in having an ESG the person, even if it is an intern."

(Edward, Impact Manager, [Scale-Up Stage] Solar Off-Grid Company)

Given the pre-existing challenges facing smaller companies, many interviewees thought it was unfair to hold these companies to the same standard as the large companies. Many interviewees suggested finding ways to give these companies capital and support their growth by improving reporting. Miles highlighted how unjust it is to hold these companies to the same standard as large companies.

"Is it fair to hold LMDs to the same standards that we might hold investors and the larger, vertically integrated multinational upgrade companies? The answer to that is no; I do not think

it's fair that we hold everyone to the same standard. These companies that are just getting started have so many challenges just even producing quality financial statements. So, to pile on top of that a significant ESG reporting burden or even operational burden to expect that even if they were reporting on it, they would be showing what you would like to see. I think we need to give companies the flexibility to grow into that."

(Miles, Director, Investment Firm & Fintech Company)

Impact investor Shaun agreed with other interviewees that small companies struggle to develop the necessary ESG policies or report their impact to investors. They use tranche disbursement methods to circumvent this challenge with conditions on subsequent capital disbursement. His company is one of the few that commit capital to these companies with conditions to be met before or afterwards to incentivise them to meet the sustainability metrics.

"We have seen them facing issues like the smaller ones (meaning companies) that are operating with 10–12 employees, and they find it really difficult to create those (ESG-related) policies. (...) But yes, they do struggle with the impact reporting numbers and sort of things. (...) So, we do put CPs, which is called conditions precedent (CP): Those conditions are the ones which mean they have to obey before getting the money (...). But these are just the ESMs (Environmental Social Management systems) side of things. (...) And the other side of the thing can be CS, which is called condition subsequent (CS): So, those are the kind of conditions that we put in place after we have dispersed [some of] the money; we give them 90 days to work upon the policies and other conditions that we put in place."

(Shaun, Investor, Impact Investment Fund)

Capital access is significantly affected by a company's ability to report on sustainability metrics thoroughly. Reporting these metrics is costly, especially for smaller companies with fewer financial resources and skill gaps. As a result, these companies struggle to raise capital, and, at times, when they do, their capital is expensive and accompanied by conditions to meet before and after disbursements. Given the flow of reporting mandates and the reporting chains and structures of capital access within the sector, small companies are often (unfairly) held to the same standard as large companies with

more resources, further explaining why they continue to struggle.

6.3.4 Partnerships and Collaborations

Partnerships and collaborations are significant and invisible factors that influence capital access. Unbeknownst to energy companies, relationships built among investors may determine their access to capital or lack thereof during a fundraising round. Investors are keen to build relationships with other investors, incubators, academic institutions and industry associations, among many other groups. Although all these relationships and connections are vital, this section focuses on the connections among investors and how these influence capital access.

Most investors, by nature, are risk-averse, particularly when investing in emerging markets in which the additive effect of perceived risk may dissuade them from investing their capital in energy companies. Some investors require an anchor investor who provides the bulk of the capital, catalytic financing, or both. Catalytic financing can come in many forms, but one example is an investor who may accept receiving less return as a junior equity investor to allow those in senior equity positions to receive more returns. Furthermore, they may offer first loss protection, absorbing a significant percentage of a loss if an energy company goes bankrupt. On the former, this is catalytic because it encourages other investors to invest in a company since they will make higher returns, and on the latter, it reduces the risk of loss. Regardless, few investors are willing to anchor investments due to the risk burden. Gia explained the rarity of anchor investors.

“So, for ‘Fund FS’, they invest in such projects (meaning high-risk impact projects) and, most of the time, anchor investments (...) because most investors run away from high-risk investment. (...) They put catalytic finance in, hoping it would attract other investors like DFIs. (...) Investors shy away if there is no catalytic funding. What we do is (...) we make sure we have someone who would be interested in anchoring the investment. They are not very many. They are few, but at least they are there.”

(Gia, Technical Capital Markets Specialist, Investor & Development Agency)

To confirm Gia’s point, two DFI investors, Patricia and Walter, stated they only invest in projects supported by other investors.

“We don’t really like taking the lead. We prefer another investor to lead, because we are a smaller DFI. In another transaction, we had the European Investment Bank (EIB), the Austrian Bank, OED, and then us. So, the EIB was taking the lead. They did a bigger ticket of ~65 (millions). They (OED) did 25 (million) or something; then we did 15 (millions).”

(Patricia, Investment Officer, DFI)

“We are a minority investor (...). So, then, other partners have to be around the table. So, if it is a US\$100 million project and we provide 20 million, then there has to be another 80 million in the year coming from others. We only get involved in fully funded projects. So, then that means that we are not by ourselves.”

(Walter, Regional Director-East Africa, DFI)

These partnerships also increase the number of investors and the quantum of capital in funds or programmes. Jackie explained that a programme her organisation initially funded attracted investors from other governments, and even the World Bank joined. As a result, more capital was available for this programme.

“We were funding Financing Locally-Led Climate Action Programme (FLLOCA). Later on, the World Bank came to me and asked if they could also be part of FLLOCA. And we are like, why not? Denmark also came on board. Germany was coming on board, and [it] grew into something big.”

(Jackie, Investor, DFI)

Ultimately, partnerships among investors incentivise more financing for energy companies, mainly because they provide an opportunity to share risk. Simply put, there is strength and safety in numbers, making an investment successful in raising the needed amount, and this provides ‘extra eyes’ for thorough due diligence and, most importantly, risk-sharing.

*“So, there is the sharing of the **ticket or the investment**. Then, number two is risk-sharing; we feel more comfortable when there’s another DFI or investor because it’s an additional pair of eyes. When they do due diligence, maybe they will come up with other things that we will not come up with. (...) And then also **it saves time for both us and the company that’s looking for***

financing because (...) it's more efficient to go (fieldwork) in together. But I think the biggest thing is risk-sharing."

(Patricia, Investment Officer, DFI)

Although existing collaborations and partnerships have enabled capital access to companies, more is needed, especially among different groups of investors. Miles stated that, through collaboration and communication, grant funds could help early-stage companies unlock debt and equity financing. He bemoaned that this collaboration does not happen frequently and added it could bring investors to the attention of good companies that have successfully passed due diligence.

"But some of those bigger grant funds, and especially the ones that are more multi-country or pan-African, I think have been really helpful in reaching some of the smaller markets. I think there could be helpful collaboration across equity, grant and debt providers. (...) Basically, if a grant provider evaluated an early-stage company, thought it was a good company and was making that grant investment, that would both be a vote of confidence in that company and it would also provide some of that equity base, which could be leveraged for borrowing."

(Miles, Director, Investment Firm & Fintech Company)

He further explained how such a collaboration enabled his fund to invest in an early-stage company. He stated that, through his personal networks, he contacted a grant investor who provided funds to a potential investee to hire a temporary CFO, a skill gap that would have deterred his firm from investing. This example demonstrates how such partnerships enable investments and can 'make or break' a potential investment in a company.

"So, 'Fund E' has a relationship with 'Fund D'. And through that relationship, we were considering an investment in a company that checked a lot of boxes. We thought they were going to be a really great investment opportunity. During the investment evaluation process and due diligence, the finance manager left. And we were saying you need to have this role filled for us to invest. We need to have confidence that someone is managing the finances of the company, and they really struggled. (...) And so we went out (to 'Fund D') and said we really want to make

this investment, but this is a critical blocker for us. (...) So, 'Fund D' came in and paid for a temporary CFO that lasted for at least six months."

(Miles, Director, Investment Firm & Fintech Company)

Miles explained that although that investment happened due to his networks, this is a gap he would like to see addressed with a more coordinated, structured way to unlock capital for early-stage companies.

"That had to happen on a very ad hoc basis through individual personal relationships that we had. It didn't happen in a structured way, and that is something I would also like to see more of in the sector."

(Miles, Director, Investment Firm & Fintech Company)

6.4 Conclusion

This chapter discussed endogenous and exogenous factors that influence capital access for the energy sector in Kenya. The discussion aimed to answer the second research question: What factors control investment decision-making for energy investments in Kenya? This chapter sought to understand how the practices of financialisation actors, mainly investors, influence their investment decision-making and what factors control it. The research supplements previous chapters by revealing an uneven investment outcome clustered around large companies, whereas many smaller companies struggle to access capital.

During investment due diligence, investors assess four key intrinsic company characteristics: financial performance, management, business model and the company stage. Profitability and financial performance are the most salient factors in providing funds to energy companies. Therefore, business model factors, such as target customers, market size, scalability pathway, business structure and competitive advantage, are assessed to clarify the ease and certainty of achieving profitability. Capital access in Kenya is subject to a "financialisation-centric" development, with a keen focus on mobilising private capital (Bougrea, 2024; Mawdsley, 2018). However, the shift from aid to investment also transforms aid recipients into investees, with the latter expected to

generate returns for the investor, so they must be profitable. Therefore, private sector practices, finance-led strategies, logic and rationale privilege profitability. These practices confirm why investments cluster around the few large growth stage companies, since investors are risk-averse and wary of small companies. Investors' expectations are often too high for small companies, chief among them being the prohibitive expectation of having substantial *"skin in the game"*.

Risk (real or abstract) and its perception also affect capital access. Some studies have indicated that SSA countries are perceived as more risky to invest in (Alami and Guermond, 2023; Bougrea, 2024). This perception further explains why scale-up companies, such as d.light, are now using SPVs to access additional capital, but most importantly, why most of the capital clusters around a few large companies. A compounding factor is the skills gap prevalent in small and start-up companies, presenting a cyclical problem in which such companies cannot access the capital to hire the required talent and, in turn, cannot raise financing, so they are locked in an inescapable 'unprofessional loop'.

The findings regarding exogenous factors further explain the uneven investment outcome. At a global level, due to the perception of high risk, foreign-denominated capital flowing to SSA is expensive, meaning investors expect higher returns than in other regions. Although some international investors have provided capital previously, they posited that SSA does not offer the desired investment returns and, as a result, they have become more averse to investing. This reluctance affects the volume of capital flowing to SSA; hence, less capital is available for companies. Moreover, the FX risk is a great challenge for small companies and can sometimes lead to bankruptcy. Furthermore, international capital flows contain sustainability conditionalities that are too costly for small companies due to the skills gap and lack of financing.

Partnerships and collaborations play a key part in capital access. Since many investors are risk-averse, many decline to invest without an anchor investor, even when it is a good company. At times, partnerships determine the effectiveness of capital-raising rounds for companies, the amount of investment and the speed of capital flow. Unfortunately, many vital partnerships that would benefit small companies are missing.

At a national level, although regulatory reforms are credited for the country's progress regarding capital access, policy instability and volatility affect the cost, speed and amount of investment in the country. This unstable policy environment reduced investor confidence and signalled high investment risk. The disadvantaged starting position of Kenya and other countries in SSA means that providing a stable policy environment is imperative, as instability has resulted in low capital flows in the country.

On the one hand, there is an emphasis on commercial success for energy companies due to the “financialisation-development” nexus focusing on profitability. However, the actors argued that commercially sustainable companies can create a greater impact in the long term. Regardless, this highlights that actors' financialisation practices, logic and rationale are dominant and continue to permeate development sectors, such as energy, and, most importantly, lead to uneven investment income that favours large companies.

Chapter 7 : Sustainability Evaluation of Capital Access: A Transformative Investment Impact (TII) Index

7.1 Introduction

Chapter 7 operationalises the findings of Chapters 4, 5 and 6 through the use of calculative practices to create an index that captures capital access sustainability (CAS). The findings in the previous empirical chapters provide the context, justification and rationale for the CAS definition, index construction and evaluation of private investments using the index. A transformative investment impact (TII) index was created to capture CAS and evaluate private investments in the off-grid sector to incentivise actors to transform their investment practices. This is because uneven investment outcomes resulting from existing actors' practices and factors controlling capital access further exacerbate and deepen capital needs and gaps. The use of the index aims to answer the third RQ: What kinds of investments promote sustainability in capital access?

This chapter is organised into seven key subsections: 1) the index context and justification; 2) conceptualising CAS; 3) the process of applying calculative practices to sustainability metrics; 4) framing the TII index factors: from principles to evaluative factors; 5) constructing the TII index; 6) evaluating investment sustainability using the TII index; and 7) the TII index limitations.

This chapter problematises the normative capital access understanding that keenly focuses on the quantum of investments; while vital, that approach is insufficient for addressing capital access issues, especially when the same capital is provided within the context of 'financialisation-centric' development. This chapter reasserts that capital provided in this context needs guardrails to achieve sustainability. The chapter further recommends utilising actors' normative calculative practices of sustainability metrics as a tool for capital access to incentivise the necessary investments for Kenya's energy sector. This chapter constructs a TII index to incentivise actors (investors) to

invest in a manner reflective of the needs of the country and the energy companies because, as it stands, the status quo is unsustainable.

7.2 The Index Context and Justification

Financing for climate change-relevant sectors, such as the energy sector, mainly focuses on the quantum of investments. In the PA, the developed-country parties agreed to mobilise US\$100 billion annually to support both climate change mitigation and adaptation, with a keen consideration of developing countries' needs, interests and priorities. The parties also agreed that a decade from 2015, they will scale up this capital from the existing benchmark as part of a new collective quantified goal (NCQG) (United Nations, 2015). Again, the focus here is on the quantum. SDG 7 – Energy Access – is one of the two goals that mention the need to promote international financing for energy infrastructure, in addition to SDG 17, which calls for overall partnership in mobilising capital for developing nations.³⁷

Long before the collective global partnerships in SDG 7 and climate-related sectors, Kenya relied on international financing to build large energy infrastructure with World Bank Group financing projects in the 1970s,³⁸ 1980s³⁹ and 1990s⁴⁰ (Newell and Phillips, 2016). In 2015, Kenya's first NDC stated that its efforts to fight climate change would solely rely on international finance, a stance revised in its subsequent NDC submission in 2020, with a pledge to finance 13% of the US\$62 billion budget (Ministry of Environment and Natural Resources, 2015; Ministry of Environment and Forestry, 2020). However, the country's reliance on international finance has been very high. In addition to this reliance, there is a narrow focus on the quantum of investments. In 2016, the MOEP and SE4ALL published an IP with a list of energy projects with estimates of costs and the type of capital needed (SE4All and MOEP, 2016). In 2018, the KNES estimated the off-grid sector would need US\$457.5 million to provide SHS

³⁷ <https://sdgs.un.org/goals>

³⁸ <https://projects.worldbank.org/en/projects-operations/project-detail/P001232>

³⁹ <https://projects.worldbank.org/en/projects-operations/project-detail/P001314>

⁴⁰ <https://projects.worldbank.org/en/projects-operations/project-detail/P001344>

to 1.96 million HHs and approximately US\$2.3 billion for grid and minigrids(MOEP, 2018). Although this strategy was to help Kenya realise universal energy access by 2022, the goal was not achieved.

The MOEP then drafted an energy transition and investment plan in 2023, highlighting its new investment needs: approximately US\$180 million to transition fully to clean energy by 2030 and achieve 100 gigawatts (GW) of RE sources by 2040(MOEP, 2023). Furthermore, the National Energy Policy 2025–2034 revised universal energy access to 2030. When revising or releasing new policy or strategy documents, Kenya often provides an estimated amount of the capital needed, as in its revision of 2015 NDC estimates in the 2018 NCCAP. None of these revisions have addressed capital access issues beyond the quantum. This chapter uses the findings in Chapters 4,5 and 6 to address some of these gaps and needs.

The findings in the previous chapters provide a foundational context while highlighting the identified needs and challenges of capital access in the sector. Having pulled itself out of the severe '*capital paucity*' stage to the '*capital growth*' stage through regulatory reforms, Kenya's latter stage was characterised by more engaged public investors who invested more capital frequently in diverse multiple projects. This pool of erudite public investors provided a foundational launch for institutional investors in subsectors such as off-grid, derisking private investments. As a result, capital access in Kenya is a success in some ways but a failure in others. Researchers have consistently ranked Kenya in the top 10 in capital access in Africa(CPI, 2024; Climate Policy Initiative, 2022). Nevertheless, a general insufficiency of capital still exists. There remains a genuine need for more capital for the energy sector in Kenya, but this is not the only challenge.

Most public borrowing – by the government and its agencies – is, alarmingly, in the form of debt, with a rapid absorption of commercial rate debt, which is growing twice as fast as concessional debt. Although the government played a key role in enabling its agencies to access cheaper capital, it is now highly indebted, with a lower credit

rating(CPI, 2024). The government's public debt (70.8% of the GDP) is above the set anchor debt limit (55%), and in 2024, its credit rating was downgraded, which has dire future capital cost implications(CPI, 2024; The National Treasury and Planning, 2023). Hence, the government's role in aiding public agencies in accessing cheap capital will diminish, and there will be increased private sector participation.

Regarding private investments – in privately owned companies – investors and capital cluster to a few large international companies, producing an uneven investment outcome. These few companies enjoy vibrant engagement with multiple investors; relationships are leveraged for subsequent investments, and referral from those investors leads to additional capital access. Catalytic financing for small- and medium-sized companies is rare and meagre. Due to profitability considerations, endogenous investment decision-making criteria favour the few, while many struggle. In addition, the exogenous factors considered only exacerbate the struggle of smaller companies.

Due to Kenya's heavy reliance on international finance, the high-risk perception of emerging markets priced in the capital, coupled with FX risk, creates a 'perfect storm' in capital availability, affordability and volatility challenges. Depending on its severity, a coincidental intersection of currency devaluation and debt repayment can bankrupt a company. Furthermore, the aversion of local financing institutions and the lack of catalytic financing, such as guarantees to mitigate their risk, generally make capital access more difficult. Hence, the current capital provision for the energy sector in Kenya is not only unaffordable, insufficient, and infrequent but also has limited reach due to clustering, and it rarely reflects the relevant or adapts to the needs of companies. These findings reveal that capital access should be evaluated through six principles: reach, relevance, frequency, sufficiency, affordability and adaptability.

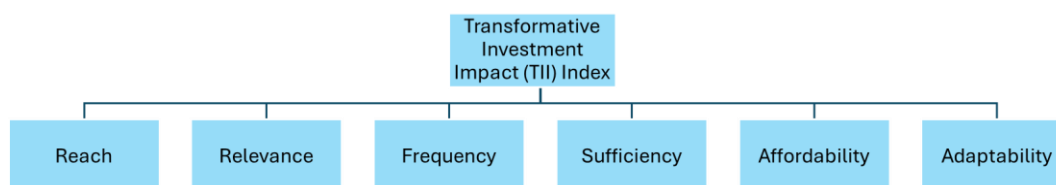


Figure 19: Principles of Capital Access

The six principles address the current capital access gaps and challenges in Kenya. A narrow focus on the quantum of capital has led to several implications in Kenya. First, the capital clustering on a few companies means many local small- and medium-sized companies do not scale to the growth stages, contributing to a limited investment universe; saturation in the few means investors only focus on a limited number of companies. Most importantly, the lack of growth of smaller companies means marginalised niche markets are not served. These are markets that the large companies may deem unprofitable to serve. Sufficient capital provision for larger and smaller companies would collectively contribute significantly to universal energy access. In part, this situation undoubtedly contributed to Kenya's failure to achieve its universal energy access goal in 2022. Finally, there is a broader concern about capital net extraction from emerging markets. This point is key, because capital is expensive, and FIs must provide returns to investors. Titus expressed his concern regarding this issue.

"I always think it is a shame that we cannot get more African-based investors, because all the profit's made on an investment or the return on investment, [and] if it's international investors, it ends up leaving the country in which we are doing operations. So, I would love to see more local capital available. (...). So, I think it's a shame that not more investment in renewable energy projects comes from investors in Africa, because that would be a great way to keep the wealth within the country in the long term. So, yeah, I guess my point is that local capital would be awesome to see."

(Titus, Finance Officer, Distributed Electricity Utility)

Although the energy market will always be a mix of both private and public, local and international, it is crucial to advocate greater financial instrument diversity, such as guarantees that incentivise local companies to receive local financing. Given the introduction of 'profitability' to climate finance and, consequently, to sectors such as the energy sector due to 'financialisation-centric' development, it is paramount to balance national sector interests, gaps and needs with those of investors.

Given the prevailing practices, norms and outcomes, CAS is conceptualised and operationalised by applying calculative practices to create an index: the TII. The following section focuses on the conceptualisation of CAS and calculative practices.

7.3 Conceptualising CAS and Calculative Practices

This section synthesises calculative practices, sustainability metrics and capital access within the context of the financialisation-development nexus. The section proposes CAS and leverages calculative practices to incentivise investor practices to minimise uneven investment outcomes in Kenya's energy sector and applies the principles discussed in the previous section to define CAS as '**frequent and affordable capital flows that are adaptive, relevant and sufficient to the needs of the sector/industry, providing a broader reach of financial provision to companies or projects of different sizes or at different stages**'. Sustainability for capital access means investments that result in balanced out local and international capital access that can perpetually grow or improve whilst having a net positive outcome for both capital providers, recipients and the broader citizenry. It builds upon the findings in Chapter 6 (Section 6.3.3) that confirms a strong relationship between the reporting of sustainability metrics and capital access. Calculative practice methodology is applied to reveal the newly proposed CAS. The motivation is twofold: to encourage investors to invest in a manner that bolsters industry growth and to incentivise and reward such investors during capital-raising.

Calculative measures help identify, count, measure and quantify CAS constitutive indicators to provide transparency, visibility and simplification. Hiss posits that the financialisation of sustainability applies evolving calculative practices to coalesce non-financial metrics, such as ESG factors, into financial accounting mechanisms, tying them to the rules of financial markets (2013). She further highlights that investors channel their capital depending on sustainability indicators, and without these indicators, sustainability may be neglected altogether (Hiss, 2013). This point corroborates the findings discussed in Section 7.3.3, revealing that capital flows follow

the same pathway as sustainability metrics and are primarily mandatory. Reporting compliance is leveraged by energy companies, FIs and even investors to raise additional or cheaper capital. Using aggregate ESG scores and the impact numbers produced through calculative practices is now the norm in investment practices, especially for those who aim to fund SDGs. Therefore, this research utilises the same practices to monitor an aspect that has remained invisible: capital access. Eloise, providing an example of financing in the minigrids sector, stated that people should push for more impact analysis at the fund (investor) level, as well as transparency in this analysis.

“So, they [investors] always rank the cost per connection depending on the amount of financing a developer gets. What if we look at the cost of connection at the fund level? For example, this fund was sixty million; it ended up with three thousand mini-grid connections; what was the cost? So, I would like to start valuing the funds better based on how many connections [there] are. We also want to start making that data public because we should all be pushing for more impact. So, AMDA needs to be more data-driven in gathering and organising data; they need a data team that does this research for each fund.”

(Eloise, Grant Manager, Philanthropic Investment Foundation)

In the quote, Eloise proposes adopting the same ‘yardstick’ used to measure impact at an energy company level for the funder. As observed in Chapter 6, the measurement, monitoring and evaluation of sustainability metrics in Kenya’s energy sector are primarily portfolio-centric, and rarely are they fund-centric or investor-centric. Eloise proposes a fund-centric impact analysis. Complementing that proposition, this research proposes a fund-centric impact analysis of an aspect at the core of the investor's primary role: capital provision. Discussion regarding capital access mainly focuses on country comparisons (CPI, 2024; Climate Policy Initiative, 2022). However, few scholars, and often none, analyse how the provided capital supports energy companies by addressing prevailing capital access challenges within the broader umbrella of long-term sustainable development goals. Others have focused on how capital flows match the identified capital (quantum) needs in the NDCs (The National

Treasury, Climate Policy Initiative and The Kenya Climate Innovation Centre, 2021). Although this aspect is important, it is insufficient. Even though the global collective efforts, as detailed in the PA, will be revising to raise the ceiling of the annual capital provision from US\$100 billion in 2025, the capital access challenges in emerging markets are more complex than this. Although the goal of securing more financing should be pursued, it is arguably equally important, if not more so, to consider when that financing is provided, to whom, in what manner and the role it plays not only at the company level but also at a sectoral level. No frameworks have been created to track investor capital provision performance in an energy market.

Although a new metric is proposed, it utilises the same normative practices of leveraging sustainability metrics to access capital. Proposing new solutions that utilise existing investor practices is strategic because it minimises the ‘knee-jerk’ rejection of entirely new ones. One interviewee, Alan, in Section 6.3.3, highlighted that it is easier to communicate sustainability metrics using both quantitative and qualitative narratives. He stated that those who only use qualitative methods find it difficult to communicate and leverage their impact. Hence, creating an index that aggregates both qualitative and quantitative indicators is an effective tool for capturing all the indicators.

Aggregate scores or measurements, such as indices, are useful for providing a broad composite picture. An index broadens the capital access discussion beyond the quantum to include new indicators. This tool simplifies the discussion by consolidating multiple indicators into a single unit output that captures the broader concept of capital access. Given the multiplicity of indicators and the large volumes of quantitative and qualitative datasets, a composite view would normally be challenging when envisioning a score that can be objectively compared among investors. The index is also a keen effort to change normative capital allocation, which leads to uneven investment outcomes, and to encourage sustainability in capital access. Despite these benefits, calculative practices and their application have limitations.

Calculative approaches in the industry have been criticised for privileging financial materiality when judging weight allocation (Dimmelmeier, 2024). When aggregating indicators, such approaches have sometimes been imperfect at conflating input and output factors. Dimmelmeier proposes scrutinising vulnerabilities that may indicate greenwashing. Greenwashing of sustainability metrics is when funds or energy companies communicate sustainability metrics that misrepresent their achievements in amount or form. Hiss also criticises such approaches by stating that important datasets that are not easily quantifiable are omitted, reducing complex issues into simple aggregate factors, making critical datasets invisible (Hiss, 2013). Calculative practices can also be exclusionary, not just in the selection of the datasets but also in the voices that shape the selection of indicators. This exclusion means that some have called for the process of stakeholder engagement to be improved and for different voices to be included (Kaur and Lodhia, 2018; Bellucci et al., 2019; Hiss, 2013). Despite this criticism, Dimmelmeier mentions that researchers who want to transform financial systems should find leverage points of calculative practices in sustainability reporting. This chapter hopes to do that.

Notwithstanding these limitations, applying calculative practices in sustainability reporting provides a comprehensive composite outlook that increases the breadth of capital access, leveraging impactful capital provision, and it is an effective tool for improving decision-making. Although subjectivity is applied to metrics construction, the aggregate factor provides *subjective objectivity*. Since this chapter proposes a broader outlook of capital access and its operationalisation through an index, the following section discusses the index's construction process.

7.4 The Process of Applying Calculative Practices to Sustainability Metrics

This section details the process of designing, constructing and evaluating CAS using calculative practices, outlining the steps followed to create the index and its application. The process included five key steps: conceptualising CAS, framing factors, constructing the mathematical model, evaluating, and proposing its industry

application. These five steps are discussed in the same order. All the steps are illustrated in Figure 20, below.

Conceptualising CAS included four activities. The first activity was research, which included collecting primary and secondary data sources, analysing them and synthesising the empirical findings, as discussed in Section 7.2. Second, the formulation of CAS guiding principles (illustrated in Figure 19) was informed by the synthesised empirical findings in Section 7.2. Third, defining ‘sustainable capital access’ was guided by the principles formulated in the previous activity. The framing factors were the next key step.

The first stage of framing factors included scoping to determine relevance, calculability and data availability. The word ‘factors’ means ‘indicators’. This activity also includes dataset selection. Once the datasets are selected, their relevance to demonstrate CAS is assessed. To integrate qualitative datasets, calculability is assessed, or their ability to be transformed into quantitative proxies to capture the complexity of their contribution. For example, when evaluating investor contribution, the proposed TII index considers when the investors first invested in Kenya to reflect the risk absorbed, informed by the country’s regulatory background and evolution over the years. To capture this aspect, the market entry of an investor is used, since this contains the year of the first investment. Years are easily quantifiable and help determine the risk absorbed depending on the earliest investment. The next step is to categorise the market entry data into manageable categories based on the duration of the dataset and other information. All the indicators have categories for their variables. Then, an informed weight allocation is applied to indicators and their variable categories using the empirical findings, academic literature and industry information.

The next key step is constructing the mathematical model or index. First, it acknowledges or establishes the assumptions and hypotheses of the mathematical model. Varying definitions, subjective weighting allocations and variable categorisations mainly inform these assumptions. Then, the model is constructed and

tested using sample data. The results are then validated against the expected outcomes to determine whether the model outputs accurately reflect the underlying assumptions and hypotheses. If any errors are observed, the mathematical formulae are refined, tested and validated until the results align with the model's assumptions and hypotheses.

The final stage is evaluating CAS. The first step is assessing the complete dataset using the refined mathematical model. After receiving the results, ranking and comparing the results of different investors, the findings are reported, and the implications of the results are analysed. This is the last stage in this chapter. However, since the TII index is an illustrative aggregate index, an industry application is proposed regarding indices that follow related steps to report their findings, leverage it for capital access, and conduct continuous monitoring to evolve the models to include new indicators or update hypotheses and actively reconceptualise the models. The following section focuses on the four steps of framing factors.

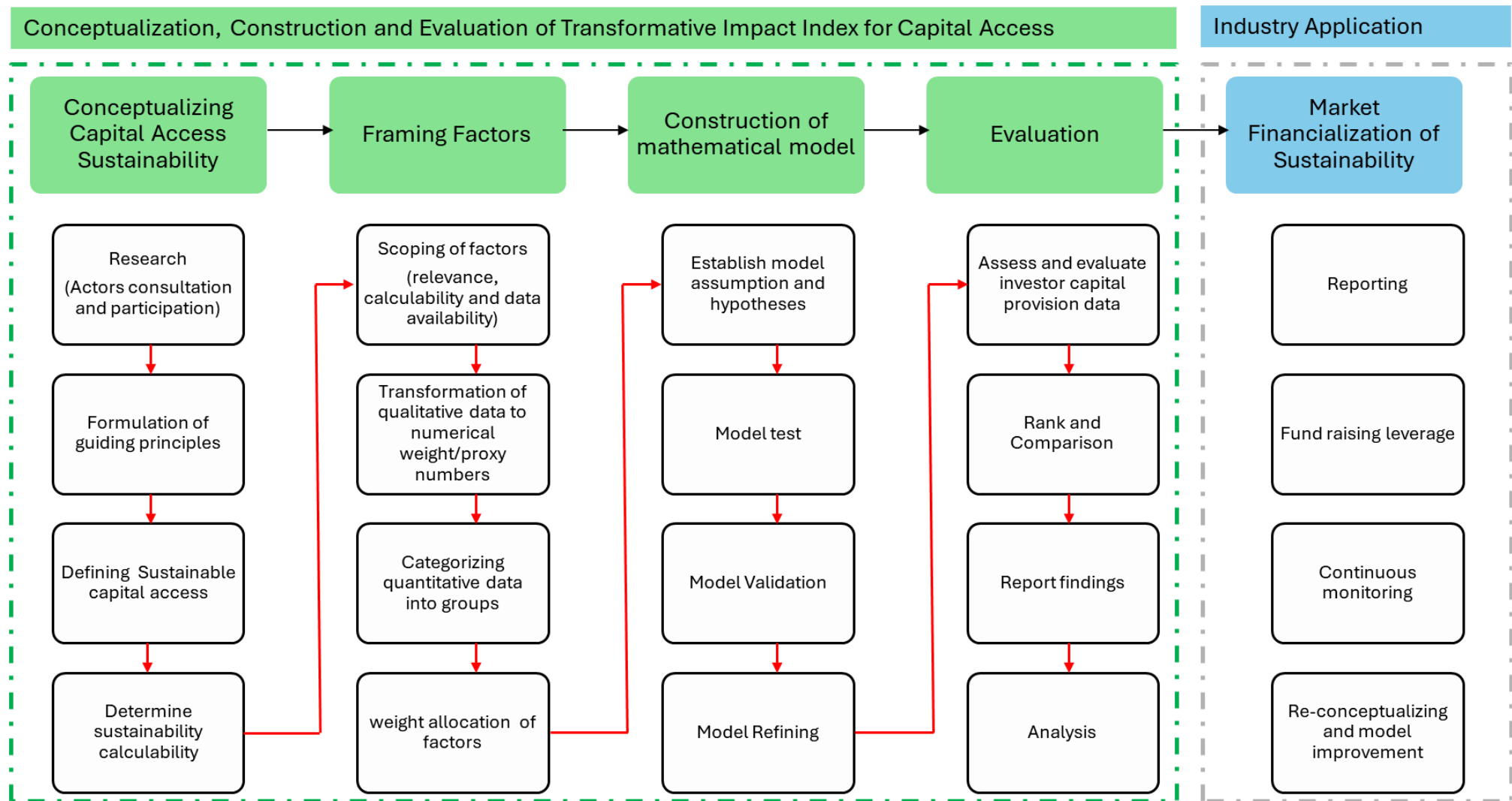


Figure 20: Conceptualisation, Construction and Evaluation of the TII for Capital Access

7.5 Framing TII Index Factors: From Principles to Evaluative Factors

This section focuses on framing factors: selecting datasets, determining their relevance against the principles, establishing the calculability, transforming qualitative data into a proxy, and discussing the selected factors to justify categorisation and weight allocation. First, the selected data is linked to the principles of CAS. The data chosen for the TII index are GOGLA and policy data. The GOGLA data were selected because they provide detailed information about private investments to energy companies in Kenya. The GOGLA data mentions clear recipients of finances, whereas the IRENA data records capital flows to projects, making it difficult to determine the official recipient. Furthermore, the GOGLA data scopes our analysis of private investments in the off-grid subsector, making the analysis manageable. The policy data were selected to provide insights into investors' contribution to the broader off-grid subsector by determining their market entry, indicating the extent of risk their capital bore. In addition to the policy data, five datasets were selected from the GOGLA data. These sets include the amount of investment, the number of investees, the company stage, the type of financing and the number of deals.

Figure 21 below, illustrates how the datasets link to the six principles. Notably, due to a lack of data, the TII index does not include affordability and adaptability principles.

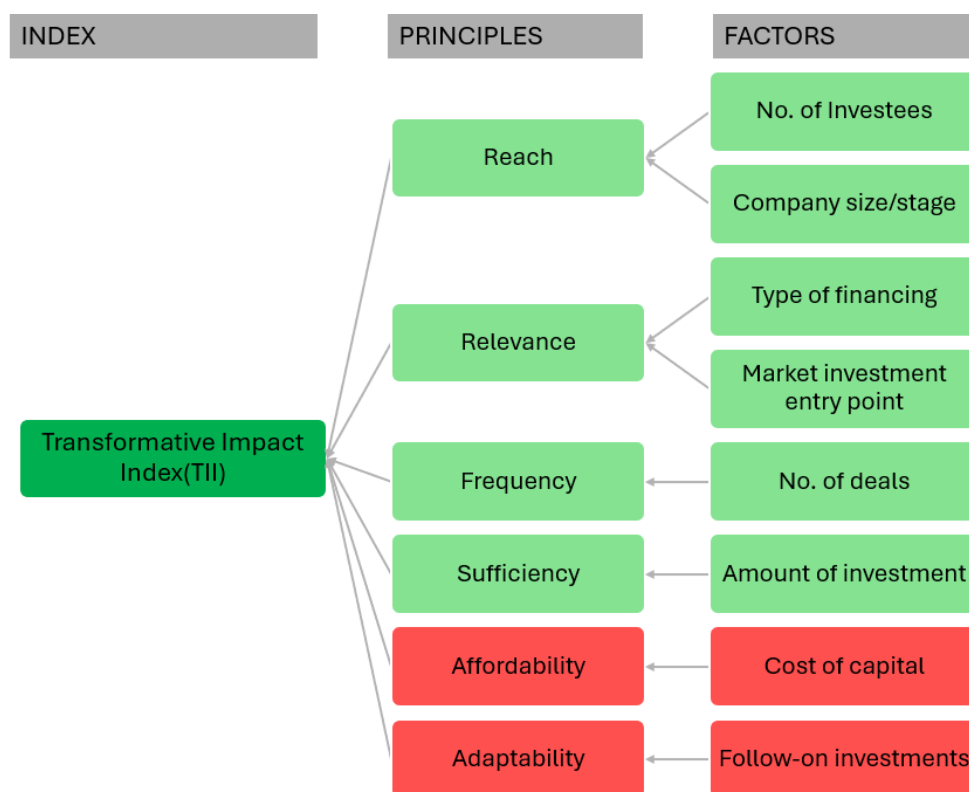


Figure 21: Linking the TII Index with the CAS Principles and Factors

The investors' TII was formed by aggregating six key factors to evaluate the off-grid market investments.

These factors are as follows:

1. Market entry investment time: The year an investor provided capital in the off-grid sector.
2. Amount of investment: Total capital provided by an investor.
3. Type of financing: The financial instruments used to finance off-grid companies.
4. Number of investees: The number of companies an investor has financed.
5. The number of investment deals: The number of investment transactions made to old or new investees.
6. Company stage: The lifecycle stage of a company at the point of investment (seed, start-up, or scale-up).

These six factors capture critical nuances of investments based on their contribution to individual companies and the broader industry. It demonstrates that the off-grid sector

should adopt a multifaceted method of analysing capital flows and access.

The TII index ranks individual investor financing based on the aggregated score of six factors. The TII combines these six factors to highlight that all investments, although at times may appear equal in monetary terms, they are not. Therefore, a composite index integrating multiple factors produces a closer representation of investor contribution or impact in a sector than a perfunctory analysis of the invested amount only. For example, in the TII index, the selected factors capture their level of engagement, time of market entry, risk appetite, reach of companies at different company lifecycles, and, of course, investment amount.

On the surface, it may appear as if, collectively, all investments are equal. However, different quantities of investments made to a recipient(s), in single or multiple transactions, at a particular company lifecycle/stage, using various financial instruments and at different times have different transformative impacts on individual companies and the broader market. Some investments are more transformative than others. This point is key, because each US\$ invested in Kenya's energy sector is not equal. One US\$ may bear more risk than another or may be a follow-on investment during a difficult macroeconomic climate or even to a different investee, contributing to the growth of more actors in the market or even towards TA, among other issues. Therefore, it is imperative, to the greatest possible extent, to consider these nuances when evaluating investments' contributions to transforming a market. One approach is to create a multi-dimensional index that considers such nuances.

This section highlighted the data selection and linked the guiding principles to the key evaluative factors. The following subsections detail how these factors are framed, categorised and allocated weights.

7.5.1 Market Entry Investment Time

This sub-section provides the foundational context regarding how TII captures policy, risk and capital access. The subsection explains how the off-grid subsector evolution

represents different risk levels and how investments reflect this. This is then used as a rationale for data categorisation and weight allocation.

Although investments have continued to flow in Kenya, the investment landscape for the off-grid sector in 2012 vastly differed from that in 2024. The off-grid market has grown tremendously from its humble beginnings, and although some challenges persist today, they differ from those in 2012. In 2012, the off-grid sector was in its emergent phase. In the year that M-KOPA was launched, the sector's potential enthused many, but the known and unknown real or perceived risks also worried many. This was the first PAY-GO system. At this stage, the off-grid sector was yet to be identified as a tool for achieving energy access. Furthermore, 2012 was declared the year of energy access by the United Nations (SE4ALL, 2024), which was reflected in Kenyan national policies, although the off-grid sector did not have a carved-out market segment. In Kenya, the only focus at the time was on the "Energy Access Scale-up Programme", which was grounded in Vision 2030 and aimed at electrifying one million HHs, health centres, schools (primary and secondary), trading centres and community water supply points⁴¹ (ESMAP, 2015). Furthermore, the focus was mainly on increasing electrification through grid connection, using the last-mile project and minigrids (Moner-Girona et al., 2019). It was not until 2018 that the KNES indicated the market segment SHS would serve, and, in 2019, came the launch of the Kenya Off-grid Solar Project (K-OSAP), making solar key to decentralised energy access through SHS and electrification through solar minigrids. Moreover, there was no clear, intentional taxation support for solar at the time.

In 2013, the GoK introduced a 16% VAT for all imported goods, including solar products, an annual challenge highlighted by investors and companies in Section 6.3.1. In 2014, the government moved to exempt solar from paying VAT tax, which boosted solar product sales. Following the exemption, SolarAid reported that the price of d.light S2, one of the solar products sold in Kenya, dropped by 15%, from KES 1000 to

⁴¹ <https://vision2030.go.ke/project/energy-access-scale-up-programme/>

KES 850⁴²(SolarAid, 2014). With reduced prices, demand went up. Given that the target clientele consists of HHs living below the poverty line, such significant price changes are substantially reflected in sales(SolarAid, 2014). However, this boost was not to last, and after six years, the GoK rescinded the VAT exemption for RE products, including solar products. This reversal was met with great disappointment and persistent lobbying by industry associations, GOGLA, AMDA, KEREK and CCAK, and the exemption was reinstated⁴³(GOGLA, 2021).

This highlights the early challenges in the off-grid market. Although the earlier years enjoyed some benefits, such as import duty and sales tax exemptions until 2015, the regulatory uncertainty or turbulence persisted. The GoK also published and enacted many national policies mainstreaming climate change mitigation and adaptation, indirectly benefitting the energy sector. Hence, investing in 2012 or the earlier years was riskier than investing in later years. Furthermore, industry associations grew stronger over the years, as did the collective lobbying power to advocate for a steady market, given the stakeholder clustering in Nairobi. In 2018, the KNES created a market for the off-grid subsector. Moreover, as identified in the 2019 national census, the off-grid market was much larger, serving over two million HHs. As such, investors were more astute about Kenya's off-grid investment landscape after many years of assessing the market's real and perceived risks.

As the years passed, more companies experienced profitable sales and market expansion, encouraging new investors in the off-grid sector, as highlighted in Chapter 5, Subsection 5.6.1. Furthermore, Parliament passed the Energy Act 2019 to streamline the energy sector in general. This regulatory background was considered when creating the TII. Therefore, the time of an investment indicates risk appetite: early investments bear more risk, and later investments have less. Early investors operated in a highly volatile regulatory environment with weaker sectoral associations, were the first members of associations, and funded commercial and non-commercial

⁴² <https://solar-aid.org/news/kenya-celebrates-vat-exemption-for-solar/>

⁴³ <https://www.gogla.org/a-big-win-for-kenya-government-reinstates-vat-exemption-on-renewable-energy-products/>

activities companies in start-ups to understand the market, acquire customers and grow. Thus, they bore more risk than later investors.

Considering this background, the TII 'Market Entry Investment Time' factor is allocated a 10% contribution. Reflecting on the regulatory environment, we further break this down across three time sections: 2012–2015, 2016–2019 and 2019–2022. Investors with an early entry to the market (2012–2015) are allocated the maximum points of 10%, medium market entry (2016–2019) are allocated 5%, and late market entry (2019–2022) 2.5%. This variable uses the year of the earliest investment of an investor to an off-grid company. Although the investment time is essential, the amount is also critical. Hence, the TII index considers the amount of money provided by an investor.

7.5.2 Amount of Investment

This subsection provides the foundational context regarding how the TII index captures investors' amount of capital invested in the off-grid sector. It does this based on the identified national capital needs for the sector published in various policy or strategic documents. This information is used as a rationale for weight allocation, and its application in the index is explained.

In Kenya, the conversation regarding the quantum of capital needed for universal energy access is common and often updated in strategy documents by the GoK or its ministries. In 2016, the MOEP and SE4ALL consulted stakeholders and published an IP highlighting private and public investment-ready projects (SE4All and MOEP, 2016). The IP included categories such as energy access, energy efficiency, RE generation, transmission, and clean cooking. The prospectus estimation of the investment needed for government projects was only US\$9 billion within three to five years (SE4All and MOEP, 2016).

In 2018, the KNES estimated that Kenya needed approximately US\$2.75 billion to achieve universal energy access between 2018 and 2022 (MOEP, 2018). This investment

was estimated to connect 5,651,300 HHs. A US\$458 million private investment to off-grid companies was part of the intervention to help achieve universal energy access by selling solar products to 2,179,730 HHs. The KNES is a prime example of an energy access national strategy document that estimates the amount of investment needed and its energy access reach.

In 2023, having failed to achieve universal energy access the previous year, Kenya published an energy transition and investment plan (MOEP, 2023). The MOEP conservatively estimated that minigrids/off-grid solutions will need US\$5.5 billion up to 2035 and approximately US\$2 billion between 2025 and 2050+. Cumulatively, the MOEP estimated Kenya needs approximately US\$600 billion for net zero pathway developments (US\$165 billion above the business-as-usual [BAU] scenario), with 57% going to transition the transport sector fully, 30% to the power sector (including the off-grid sector), and 3% to the cooking sector (MOEP, 2023).

These documents illustrate the GoK's active role in identifying sectoral capital needs. They act as a general guide to investors by revealing the country's priority sectors and subsectors. Policies to bolster investment flows in the identified priority areas often follow. For example, the KNES, published in 2018, was followed by the Energy Act 2019. These strategy documents reveal the country's vision and, most importantly, are a marker of an intended and potential operationalisable political will. Investment (quantum) gaps are assessed against such national documents. For example, in 2018, a study tracking climate finance in Kenya compared the inflow of capital to different sectors, including the energy sector, against the country's identified capital needs in the NDCs and NCCAP (CPI, 2021). As such, the amount of investment is essential when assessing capital access. Although this is the factor commonly used, it is vital.

Despite its many challenges, Kenya has attracted considerable investments in its energy sector. In SSA, the World Bank ranks Kenya third regarding ease of doing business(2020). Industry reports tracking climate finance in Africa have consistently ranked Kenya among the top 10 countries that receive substantial investment (CPI

2022, 2024). Most of the mitigation financing tracked in climate finance reports indicates that, in Kenya, the majority of such finance trickles down to the energy sector (CPI, 2021). These reports align with Chapter 5, Section 5.3, which is a comparative and temporal analysis of Kenya's capital access relative to its neighbouring countries: Tanzania and Uganda. The findings reveal that Kenya received significantly more private investments for the off-grid sector than the other two countries:⁴⁴ Kenya received US\$1624.7 million, Tanzania US\$977.8 million, and Uganda US\$895.8 million.

These investments have substantially contributed to energy access in Kenya, both in terms of reach and the shift of energy sources. As of 2019, 19.3% of Kenyan HHs rely on the off-grid sector as the primary lighting source (KNBS, 2019). Furthermore, other HHs have shifted from kerosene to solar within the tracked period. In 2009, 68.93% of all Kenyan HHs used kerosene/paraffin lamps as a primary lighting source, compared with 1.62% that used solar lanterns/home systems (KNBS, 2009). A decade after the 2009 census, ~16.5% of all Kenyan HHs used paraffin lamps /lanterns, and solar usage had increased to 19.3% (KNBS, 2019). In rural areas, the shift was even more remarkable. In 2009, approximately 83.29% of rural HHs (5,361,334) used paraffin-fuelled lamps, and only 2.21% used solar lighting (KNBS, 2009). In 2019, paraffin usage among rural HHs in Kenya dropped by 59.59% to 23.7%, whereas the usage of solar increased by 27.69% to 29.9% (KNBS, 2019)⁴⁵.

The TII index considers the investment amount an essential factor because of its contribution to Kenya's energy access, transition and climate goals. Despite the challenges and gaps discussed in Chapter 4, Chapter 5 and Chapter 6. The energy sector has grown, and the early companies have scaled up and reached more HHs in

⁴⁴ This represents the volume of money invested in off-grid companies that have operations in Kenya, Uganda and Tanzania. However, this does not mean these companies only operate in those countries, as many have operations in more than one country. That said, the investment volume is comparable across the three countries because it indicates the corporate financing (balance sheet financing) investment made to off-grid companies within those countries.

⁴⁵ The reported calculations were extracted from the 2009 and 2019 KNBS census reports. In 2009, Kenya's total number of HHs was 8,767,954; of those, rural HHs were 5,361,334. The number of HHs that used paraffin-fuelled lamps was 6,043,513, and 142,273 HHs used solar lighting in the entire country. Rural HHs that used paraffin-fuelled lamps were 4,465,206 HHs and 118,412 HHs in 2009 and 2019, consecutively. The 2019 figures were reported as a percentage. The number of paraffin-fuelled lamps is a summation of paraffin pressure lamps, paraffin lamps and paraffin tin lamps. The 2019 total number of HHs was 12,043,216, and the total number of rural HHs was 7,379,282.

Kenya. This variable ranks the investor's capital amount relative to the sector's average, and the TII index allocates this variable a weight of 25%.

7.5.3 The Number of Investees

This subsection provides the foundational context regarding how the TII index captures the number of investees an investor has financed and why it is crucial to consider this factor. It uses the findings in Chapter 5 to explain its weight allocation and application.

The third variable of the TII index is the number of investees an investor has financed. Although this is a straightforward variable that indicates the multiplicity of the companies invested in, it also reveals the diversification of the investor's capital to different companies within the off-grid sector. The number of investees is directly proportionate to the growth of the off-grid sector. Increasing the number of investees increases the number of stakeholders, competition, customer reach, product standards, fair pricing, and sector association and partnerships. This critical factor addresses one of the key findings in Section 5.4: investment clustering to a few large international companies means that small local companies struggle.

Although the ratio of investors to investees in the off-grid sector is 2.5 for every off-grid company, some investors have invested in multiple companies. In contrast, others have significant investments concentrated in one or a few companies. For example, the first two leading investors, ranked by investment amount, General Atlantic, M&G, Leapfrog, Arch EM and Solar Frontier Capital (SFC), each have an investment in one company. In contrast, SunFunder and Trine have five and nine investees, respectively. Those who invest in a few large companies reproduce the uneven investment outcome through clustering. In contrast, those spreading their investments encourage sectoral growth, competition and product quality improvement to serve targeted and niche markets.

This variable ranks investors proportionately to the number of investees (off-grid companies) they have financed. This variable assumes that the more investment is channelled to more companies, the higher the likelihood of sectoral growth. The TII index assigns this factor 25% weight.

7.5.4 Number of Deals Across Different Company Stages

This subsection provides the foundational context regarding how the TII index captures investors' two key variables (the number of deals and investee company stage) and highlights why they are crucial to consider. This factor emphasises the frequency of deals and the spread across different company stages. It uses the findings in Chapter 5 to explain its weight allocation and application.

As discussed in Section 5.4, the number of deals indicates engagement, interest and commitment in a sector. An investor with a higher frequency of transactions not only displays their commitment to the sector but also their responsiveness to the evolving turbulent capital needs of the sector since the nature of each investment transaction, in some ways, is unique. Some deals finance a new investee or a follow-on investment to an existing investee. Furthermore, it may provide different types of financing or the same financing but with varying agreements of terms, such as a provision of debt but different seniority or subordination.

Multiple investment deals do not mean an investor has numerous investees, but it is more likely. For example, Apis Partners and Investec Bank had two and three investment deals, respectively, but only one investee. Therefore, all investments after the first were follow-on investments. However, Trine had approximately 37 investment transaction deals between 2012 and 2022 with nine off-grid companies. Similarly, Energise Africa (a JV between LH and Ethex) conducted 34 investment transaction deals with five companies.

Notably, debt providers have more investment deals than equity investors. The top three investors, ranked by number of deals – Trine (37), Energise Africa (a JV between

LH and Ethex; 34) and Lendable (15) – only provided debt, which starkly contrasts with investors providing different financing types. For example, Apis Partners (2) and the Eastern and Southern African Trade and Development Bank (5) have provided debt and equity investments. The higher turnover of debt disbursements or deals confirms the findings in Section 5.7.4 that investors preferred debt provision because it was less risky, engaging, or tedious.

The second consideration of this variable is how the deals spread across different company stages at the point of investment. It is important to include the company stage because Chapter 6 demonstrated that the odds of investments are consistently against them, hence the clustering around a few investees. It deconstructs the investment deals by the investee stage and ranks the investors based on the spread of their investment across the three company lifecycle stages. These stages are seed, start-up and scale-up. Integrating the company stage into the frequency of investment provides a product of interest in the off-grid sector and the investor's risk appetite. Since the risk factor reduces as the company matures, seed companies have a higher risk than scale-up companies.

Since this variable captures these two factors, the TII index allocates a weight of 20%. However, this is spread across the three company stages, with an equal weight of 33.33% to the seed, start-up and scale-up stages.

7.5.5 Type of Financing

This subsection provides the foundational context regarding how the TII index captures the type of financing an investor provides and why it is crucial to consider this aspect. It uses the findings in Chapter 5 and Chapter 6 to explain its weight allocation and application.

The fifth and final TII index variable is the type of financing provided. Although understanding the time, amount and number of deals and investees is imperative, it

is just as important, if not more so, to consider the instruments through which these investments are made. There are two key things to consider: availability and utility. The former assesses how each type of financing is accessible to all the companies, and the latter focuses on the needs and benefits of different types of financing.

Chapter 5, Sub-section 5.6.1 discusses factors relating to financial instruments' availability, access and composition. Although the private investments data revealed that equity finance leads against debt, even though debt financing is rapidly closing the gap, the actors stated this type of financing was only accessible to a few large companies. Table 14, below, indicates all three types of finance were mainly available to the top five companies, whereas the rest struggled. Although ~US\$1 of every US\$4 of grant financing is invested in seed and start-ups, grant financing is only 3% of the total sector financing and is not only rare but highly competitive and, at times, restricted.

Table 14: Type of Financing Distribution Between Top Five Companies and Others

Type of Financing	Top 5 Companies (Scale-up)	Others (32 Companies)
Equity	82%	18%
Debt	86%	14%
Grants	74%	26%
Total	84%	16%

Regarding utility, different financial instruments play different roles, as discussed in Section 5.7. Grants, which are heavily relied on by small companies, are sharply declining and have many catalytic functions: reducing the cost of off-grid products, expanding to new geographical regions, researching customer acquisition of new markets, reaching underserved populations, financing TA, incentivising performance or results, and obtaining early investments. Although grants are not a commercial financial instrument and mainly provide support, it is salient that they are provided to support small companies. Equity financing is also catalytic and riskier for an investor to pride relative to debt. It provides the following additional benefits: it can be leveraged for additional financing; it benefits from the investor's industry experience and networks; it unlocks additional funding opportunities through follow-on investments; it provides advisory assistance regarding corporate oversight; it offers assistance in hiring key

personnel; it provides additional support through TA programmes; and it enables access to restricted grant financing. Finally, debt has provided capital to finance company operations and growth.

Based on the distinctive availability, role, impact and benefits of different financial instruments, the TII index allocated 20% weight to the type of financing factor. This weight was spread among the variables as follows: equity 50%, debt 30% and grant 20%.

7.6 Constructing the Index

This section describes the TII index construction steps to aggregate its constitutive factors discussed in Section 7.5 above. The TII index is a composite aggregated formula that sums up the five variables multiplied by their individual allocated weights. Table 15 below summarises all the variables and lists the acronyms used in the formulae and the allocated weights.

Table 15: Distribution of Weight for TII Index Factors

Variable	Acronym	Weight
Market Entry Investment Time	ITme	10%
Amount of Investment	AIri	25%
Number of Investees	NIrc	25%
Number of deals and Company stage	NDwdcs	20%
Type of Financing	TFwi	20%
Total		100%

7.6.1 Overall TII Index Formula

Equation 7.6.1-A

$$TII\ Index = ITme + AIri + NIrc + NDwdcs + TFwi$$

TII is the summation of the five selected factors, as displayed in Equation 7.6.1-A.

All the variables contribute to TII index at different weights, as listed in Table 15 above. Figure 22, below, illustrates how the factors and their variables feed into each other to create the TII index.

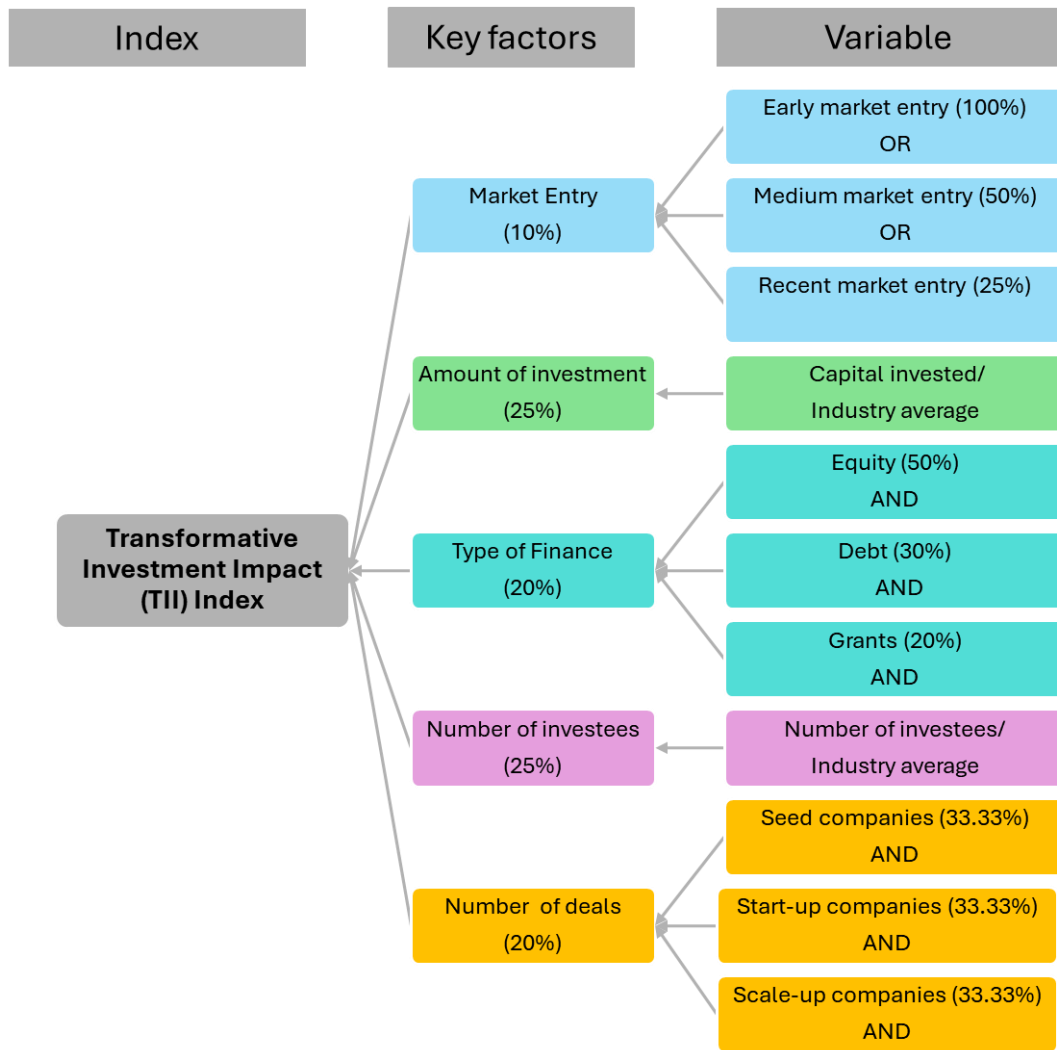


Figure 22: TII Index Factors and Variables

The following section reveals how each factor was built or applied across its unique variables, as discussed in Section 7.5. These factors are discussed in the following order: market entry investment time, amount of investment, number of investees, number of deals across different company stages, and type of financing.

7.6.2 Market Entry Investment Time (IT_{me})

With a cumulative weight of 10% on the TII index, this variable assigns investors a percentage relative to the earliest investment time. The index awards the earliest investors maximum weight, substantial weight allocation for medium entry, and less weight for recent investors. The logic of this sub-function is based on market entry (ME)

divided into three categories: **Early Market Entry (EME)**, **Medium Market Entry (MME)**, and **Recent Market Entry (RME)**. These categorisations were decided considering Kenya's context, which is discussed in Sub-section 7.5.1.

1. EME (2012–2015): 100%
2. MME (2016–2019): 50%
3. RME (2020–2022): 25%

For each investor, the $Elme$ will be a product of the overall weight allocated to investment time (IT), 10%, and their ME weight (early, medium, or recent), as demonstrated in Equation 7.6.2-A and Equation 7.6.2-B, below.

Equation 7.6.2-A

$$Elme = IT * ME$$

Equation 7.6.2-B

$$Elme = IT * EME \text{ or}$$

$$Elme = IT * MME \text{ or}$$

$$Elme = IT * RME$$

Therefore, for an investor who invested between 2012 and 2015, an early investor, their $ITme$ variable is 100% of the 10% TII index weight (i.e., 10% or 0.1). A medium-term entry investor is 50% of the 10% TII index weight, resulting in 5% or 0.05, and a recent ME is 25% of the 10% TII index weight, 2.5% or 0.025.

A company can have only one ME. Therefore, an investor will have one of three values: 0.1, 0.05, or 0.025, based on the year of their earliest investment.

7.6.3 Amount of Investment (AI_i)

With a cumulative weight of 25% in the TII index, this variable is a three-step process: (1) calculating the average industry investment to assess whether the investor amount is above or below the industry average; (2) calculating the ratio of an investor's investment amount against the industry average; and (3) multiplying the ratio by the TII

index weight of AI.

1. Average Industry Investment (AII) = Total Off-Grid Industry Investment (TOII) divided by Total Number of Investors (TNI).

Equation 7.6.3-A

$$AII = \frac{TOII}{TNI}$$

Note: The AII was calculated with an exclusion of US\$330,000,000, constituting 20% of the total off-grid investment in Kenya. This amount was excluded because it was one transaction deal from a syndicate of four investors to only one off-grid company. This sole transaction increased the AII amount by ~24%, hence the exclusion.

2. The ratio of an investor's total investment (ITI) to the AII.

Equation 7.6.3-B

$$\text{Ratio of Investment (RI)} = \frac{ITI}{AII}$$

3. Multiply by 25% TII index weight of AI

Equation 7.6.3-C

$$AIri = 25\% * RI$$

Companies with an RI>1 were capped at a maximum value of 1. These are investors whose investment amounts were greater than the industry average investments. Hence, those with investments above the industry average were assigned a maximum weight value of 25% or 0.25. The rest was proportionate to their RI.

7.6.4 Number of Investees (NI_{RC})

With a cumulative weight of 25% on the TII index, this variable is a three-step process:

1. Average Industry Investee (AIS) = Total Number of Investees for all Investors (TNC) divided by the TNI.

Equation 7.6.4-A

$$AIS = \frac{TNC}{TNI}$$

2. The ratio of an Investor's Total Investees (ITC) to the AIS.

Equation 7.6.4-B

$$\text{Ratio of Companies (RC)} = \frac{ITC}{AIS}$$

3. Multiply by 25% TII index weight of NI

Equation 7.6.4-C

$$NIrc = 25\% * RC$$

Companies with an $RC > 1$ were capped at a maximum value of 1. These are companies with more investees than the industry average. These companies were assigned the maximum weight value. The rest was proportionate to their RC.

7.6.5 Number of Deals and Company Stage (NDWdcs)

With a cumulative weight of 20% on the TII index, this variable is a four-step process that combines two key factors: the number of deals and the stage of the companies.

1. Average Industry Deals (AID) = Total Number of Deals for all Investors (TND) divided by the TNI.

Equation 7.6.5-A

$$AID = \frac{TND}{TNI}$$

2. The ratio of an Investor's Total Deals (ITD) to the AID.

Equation 7.6.5-B

$$\text{Ratio of Deals (RD)} = \frac{ITD}{AID}$$

If >1, allocate 1

Companies with an RD>1 were capped at a maximum value of 1. These are companies with more deals than the industry average.

3. Distribution of investment across different company stages: seed, start-up and scale-up. Equal weight is allocated to all three stages – the company stage allocated weight (CS_{AW}): 33.33%. These weights are added together to achieve 100%. The first step is to delimit the percentage of investments made to different company stages, such that only a company with equal investments across the three stages receives the maximum score. To achieve this, the percentage of capital invested across different company stages is divided by CS_{AW}, 33.33%. If any of the results are above 1, they are allocated a maximum value of 1.

These three equations are sequenced below.

Equations 7.6.5-C(i–iii)

$$\text{i. Weighted Seed Stage Investment (WSSI)} = \frac{\% \text{ of investment to seed stage companies}}{\text{Company stage allocated weight (CSaw), 33.33\%}}$$

If >1, allocate 1

$$\text{ii. Weighted Start-up Investment (WSui)} = \frac{\% \text{ of investment to start-up stage companies}}{\text{Company stage allocated weight (CSaw), 33.33\%}}$$

If >1, allocate 1

$$\text{iii. Weighted Scale-up Investment (WGsi)} = \frac{\% \text{ of investment to scale-up stage companies}}{\text{Company stage allocated weight (CSaw), 33.33\%}}$$

If >1, allocate 1

4. The Aggregate Company Stage Investment Variable (AC_{SI}) is the summation of the individual products of $CS_{AW} - 33.33\%$ multiplied by WS_{SI} , WS_{UI} and WG_{SI} , as demonstrated in Equation 7.6.5-D.

Equation 7.6.5-D

$$AC_{SI} = (WS_{SI} * 33.33\%) + (WS_{UI} * 33.33\%) + (WG_{SI} * 33.33\%)$$

The aggregate, AC_{SI} , is multiplied by the Ratio of Deals (RD) and assigned the allocated weight for ND to obtain the final value.

5. Multiply RD and AC_{SI} by 20% TII index weight of ND

Equation 7.6.5-E

$$NDW_{dcs} = 20\% * RD * AC_{SI}$$

A company with the maximum value of 20% or 0.2 has more investment deals than the industry average, and its investments are equally distributed across the three company stages. This reveals a greater frequency of investment and, hence, more interest and a keen commitment to investing in both small and large companies.

7.6.6 Type of Financing (TF_{WI})

With a cumulative weight of 20% on the TII index, this variable is a two-step process: distribution of the amount of investment using different financial instruments. These are added together to achieve 100%. The ideal investment combination is one of 50% equity, 30% debt and 20% grants. This is done in three steps.

1. To ensure only the investment combination mentioned above attains the maximum score, the percentage of capital invested using different financial instruments is delimited using the allocated weight for equity, debt and grants. If any results are above 1, they are allocated a maximum value of 1.

Equations 7.6.6-A(i–iii)

$$i. \quad \text{Weighted Equity Investment (WEI)} = \frac{\% \text{ of investment in equity}}{\text{Equity allocated weight (50\%)}}$$

If >1, allocate 1

$$ii. \quad \text{Weighted Debt Investment (WDI)} = \frac{\% \text{ of investment in debt}}{\text{Debt allocated weight (30\%)}}$$

If >1, allocate 1

$$iii. \quad \text{Weighted Grant Investment (WGI)} = \frac{\% \text{ of investment in grants}}{\text{Grant allocated weight (20\%)}}$$

If >1, allocate 1

2. The Aggregate Financial Investment Instruments (AFII) is the summation of the individual products of the respective weight allocations for different financial instruments with the WEI, WDI and WGI. Equation 7.6.6-B, below, demonstrates this.

Equation 7.6.6-B

$$AFII = (WEI * 50\%) + (WDI * 30\%) + (WGI * 20\%)$$

3. Multiply AFII by 20% of the TII index weight of TF.

Equation 7.6.6-C

$$TFwi = AFII * 20\%$$

The investor with the maximum value of 20% or 0.2 has a portfolio of 50% equity, 30% debt and 20% grant financing.

7.7 Evaluation and Typology

This section discusses the evaluation of private investments using the TII index. The discussion demonstrates how calculative practices can support sustainable capital access in emerging markets. It leverages the existing investment practice that uses sustainability metrics for capital access by introducing a new impact metric to a new group of actors, proposing a supplementary tool that includes a fund-centric evaluation to the normative focus on portfolio-centric sustainability evaluations in the

sector. Although achieving SDGs is imperative, it is equally important to examine who, when and how they are funded, lest these efforts end up being only short-term.

The monetary value of investments is the default and often only gauge used when forecasting and assessing public and private capital flows. At a company level, the amount of investment raised is vital. Relative to the capital needs of a company, it determines the amount of money earmarked for growth opportunities, operational activities, and hiring the required talent. At this level, the amount of financing, the financial instruments and the terms of agreements are crucial and directly impact a company's financial position. It is no wonder celebratory headlines are published and shared on social media platforms lauding a fundraising milestone, revealing the amount of investment and, at times, the type of financing. Given the painstakingly long fundraising cycles, due diligence and administratively heavy negotiation periods, fundraising is a remarkable feat worth celebrating. However, while the few celebrate, the struggles of many go unseen. Hence, to capture a sector's struggle, the analysis must extend beyond one investment transaction, financial year or investor to include different factors and variables. The TII index attempts to do this.

The TII index seeks to provide a broader industry investment perspective beyond a singular investment transaction deal to reveal investors' historical and collective transformative impacts through their investment choices. Each investment transaction in the off-grid sector is significant, as it is orchestrated by both an investor and an off-grid company and results from the capital needs of a company. Given its composite nature, the TII index does not disregard this factor. Rather, the index provides a broader, industry-level analysis that captures each investor's contribution levels in growing the off-grid sector beyond the amount of investment provided. Although some investors have provided more money than others, it is difficult to draw an informed conclusion about whether they have impacted the industry in the same way. Considering only the investment amount produces a narrow understanding of the industry. Although investment mandates and resources limit investors' contributions, resulting in differentiated outcomes, these mandates are malleable; they should

respond to the capital needs and gaps of the countries and sectors without compromising their fiduciary duty. The TII index hopes to demonstrate this point by revealing that investors can impact an industry beyond providing the highest investment.

The TII index does not aim to rank investors for the sake of it but to reveal some of the hidden transformative aspects of an investment. All investors are essential, and a low ranking does not indicate less need for such investors but represents an urgent need for broader considerations that positively impact the sector while directly benefitting the invested company. Since it is common practice to use sustainability metrics as a fundraising tool, different combinations of the TII index can be used to supplement these and introduce a fund-centric approach that pursues CAS.

7.7.1 Evaluations

The TII index results indicate that most investors who provide the highest amount of capital invest in a clustered manner, so they fail to address the sector's broad needs. In contrast, other investors made substantial investments yet were inconspicuous due to moderate rankings. When ranked using the TII index, these other investors rose to the top. The TII index results, which considered multiple factors and variables (ME, number of investees, number of transaction deals, investee company stage, type of financing and investment amount) were juxtaposed with the typical investment rankings using the amount of investment only.

To interpret the results in Figure 23, below, given the criteria established in Section 7.5, a perfect score in the TII index would be an investor with the following characteristics⁴⁶:

1. Earliest ME between 2012 and 2015.
2. Invest an industry average amount (US\$13,773,755.65) or more.

⁴⁶ Industry average numbers are used for the number of deals, investees and amount of capital provided because they provide a contextualised peer comparison that reflects Kenya's energy sector. Furthermore, this approach is used because the national capital needs identified in national strategy documents are erratic in their revisions and change significantly depending on the extent of stakeholder consultation, type of projects accounted for and varying methodologies. Most important, this approach reflects the investment practices, which are informed through

3. Have an industry average number of investees (1.84) or more.
4. Have an industry average number of investment deals (3.06) or more.
5. Have an equal distribution of investments across seed, start-up and scale-up companies.
6. Provide 50% equity, 30% debt, and 20% grant financing.

Figure 23, below, illustrates the top 10 of the 95 investors based on their investment amount and their shift in position after being analysed using the TII aggregate index. At the top of the list is a syndicate of General Atlantic, M&G, Leapfrog and Arch EM, with a 2022 equity investment transaction to a scale-up company, Greenlight Planet. This transaction alone accounts for 24% of all publicly disclosed investments made to the off-grid industry in Kenya. SFC and ResponsAbility Investments closely follow, ranking second and third, respectively, for the highest investments. From 2020 onwards, in two investment transaction deals, SFC provided US\$121,995,598 in debt to one scale-up company. ResponsAbility Investments, since its earliest investment in 2017, finalised and disclosed US\$69,000,000 in five investment transaction deals and provided debt capital to four investees, mostly to scale-up companies (94%) and the rest (6%) to start-ups. However, these investors and the syndicate do not maintain their top three positions in the TII index ranking.



Figure 23: Rank Shift of Top-10 Investors (Amount of Investment) to TII Index Rank

Given the TII's criteria above, the top three investors ranked by the amount of investment moved to ranks 42, 46 and 17, respectively. Their scores, compared with a perfect score of 1, were 0.53, 0.51 and 0.69, respectively. Although these companies provided the highest investments and received maximum TII index points for that one factor, they did not excel in others. For example, SFC invested US\$121,995,598 in debt to one scale-up company in two investment transaction deals, with the earliest transaction made in 2020. Therefore, although SFC received maximum points for investing more than ~US\$ 14 million, it received low points for having a recent ME in 2020, investment deals lower than the industry average, and only providing debt to one scale-up company. Thus, the investor had low engagement with the sector, and despite transaction deals being above the industry average, they were concentrated in one large investee. The investor has a low-risk appetite, investing only in debt to larger companies. This profile contrasts with companies that rank lower by investment amount but higher in the TII index.

TOP 10 TII-INDEX RANKED INVESTORS AND RANK CHANGE

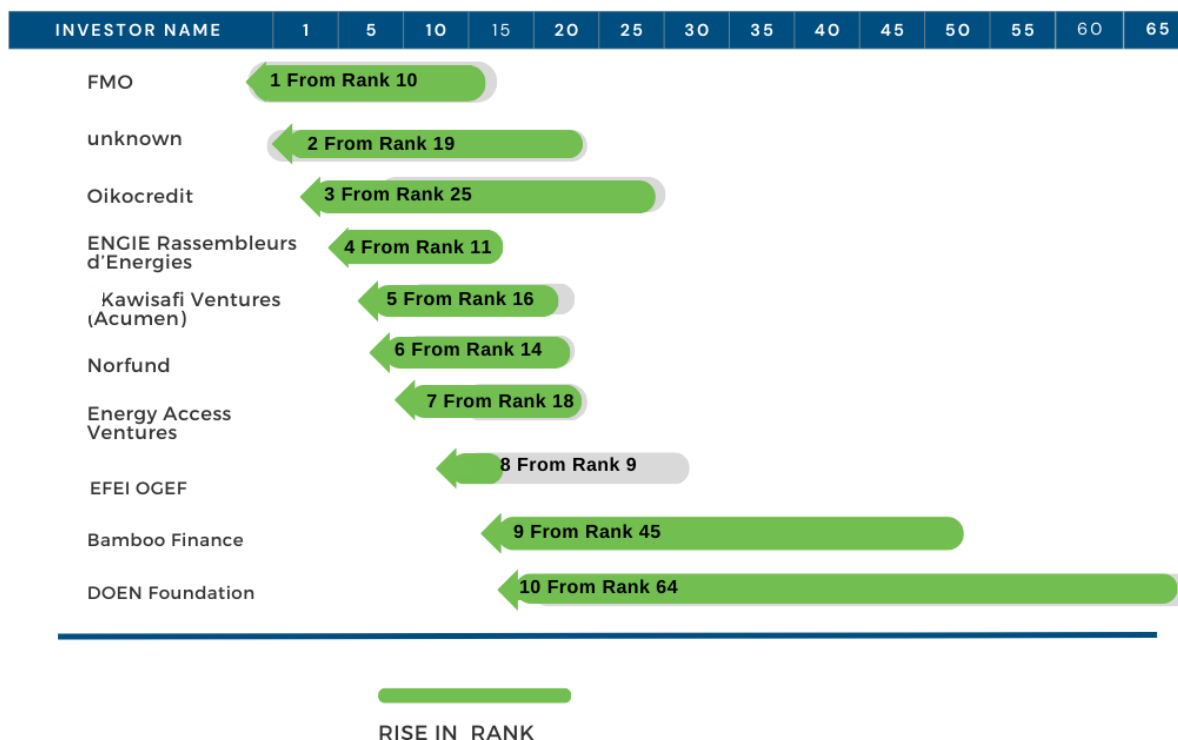


Figure 24: Rank Shift of Top-10 TII Index Ranked Investors

Figure 24 illustrates the top 10 ranked investors using the TII index. At the top of the list are FMO, Oikocredit and ENGIE Rassembleurs d'Energies.⁴⁷ These investors were formerly ranked at 10, 19 and 25, respectively, using the investment amount. They all had impressive scores of 0.84, 0.82 and 0.81, respectively. However, the most significant shifts were Bamboo Finance and DOEN Foundation, which rank at nine and 10 but were formerly at 45 and 64, respectively. To distinguish between the TII index rank and the amount of investment rank, FMO, Bamboo Finance and the DOEN Foundation are highlighted.

From 2015, 62% of FMO investments (US\$36,965,298) were provided in equity and the rest in debt, primarily to scale-up companies (95%) and start-ups (5%). The investments were executed in four transaction deals to four investees. From 2012, Bamboo Finance invested US\$8,000,000 in equity financing to three companies in four transaction deals,

⁴⁷ The ranking disregards 'unknown' investors because there is no way to verify whether this was one investor or many whose names were not disclosed. Since the index compares

most of which (62%) were to scale-up companies and 38% to start-ups. DOEN Foundation invested early in the market in 2012, investing US\$3,762,271 to four off-grid companies in seven transaction deals: 58% in equity financing, 35% in debt and 6% in grants. The investments were spread across companies at different stages: 70% to scale-up, 21% to start-ups and 9% to seed stage companies. Therefore, using the listed criteria discussed above, despite DOEN Foundation investing ~1.14% of the amount of the General Atlantic, M&G, Leapfrog and Arch EM syndicate, it is ranked 10th compared with the syndicate's 42nd position. This result is because the DOEN Foundation had high engagement levels and a moderate risk appetite for providing all three types of financial instruments and investments to large and small off-grid companies.

Capital access is not solely concerned with the amount of investment; it involves companies at different lifecycles accessing different types of finance promptly. However, this situation is currently not generally the case. Although investments in the off-grid sector grew between 2012 and 2022, this masked the capital access struggles of ~87% of companies, most of which were at the seed or start-up stages. To assess capital access in a sector, a quantitative analysis of investment trends and patterns and a qualitative, in-depth understanding of invisible struggles, needs and gaps are needed. The TII index attempts to capture Kenya's energy sector capital needs and gaps and proposes a broader consideration of capital access in the academic literature and investments. In its original formulation or modified version, the TII index can provide an analytical tool for assessing an investor's contribution to capital access. Many investors (FIs), if not all, are enforcers and vehicles for transmitting sustainability metrics reports from investors to investees and vice versa.

Although this illuminates the milestones of their investees, it has long neglected the collective understanding of how consistent investment patterns shape and influence uneven investment outcomes and their effect on the sector in general. It highlights their contributions towards SDG 7 but fails to reveal how these goals are financed. On the rare occasion it does, it is only to the extent of the estimated amount of capital and,

at times, the type of finance. Furthermore, given the identified clustering to a few energy companies, the impact (sustainability metrics) of a few energy companies is reported by many multiple investors as their contribution, and even though this is not greenwashing, since their investments facilitated that impact, it offers a false sense of progress.

Given the leverage power of sustainability metrics, investment clustering, which makes it difficult to attribute the impact to one investor, is a vulnerability that investors may exploit through over-attribution of their contributions to an energy company, because those achievements are shared among many investors. This chapter proposes that, although investors must report on the indirect impact achieved through their investments, their primary and direct role is capital access. This impact can be directly attributable to each investor, leveraged regarding its merit while simultaneously being utilised to reduce uneven investment outcomes. It is not shared and does not present an inflated view of investors' contributions. Although impact methodologies are beyond the scope of this thesis, a metric, such as the TII index, should be introduced to reveal investors' attributable contributions to capital access. However, this is contingent on the transparency of the investment ecosystem, a difficulty that needs a collective effort to solve.

7.7.2 Typology of Assessment

After evaluating investments at the investor level, the results were categorised into three key groups: unsustainable, growth and sustainable. These three groups are based on Kenya's average TII index score (0.51) and the number of factors an investor has satisfied. Given the limitations of investment mandates, it is probable that investments will rarely capture a perfect score.

Unsustainable investments in Kenya's energy sector would constitute investments with a TII index below 0.65. To achieve a higher score means, at the very least, satisfying three or more categories of the key factors. The unsustainable capital access reproduces uneven investment outcomes that propagate the status quo. The growth category is for investors who score between 0.66 to 0.75. This category necessitates the investor

contributing substantially across the five factors or having perfect scores in at least four of the five factors. Although imperfect, these types of investments respond to the sector's needs and gaps and contribute to the sector achieving CAS. Finally, CAS is provided by investors whose TII index score is above 0.75. These investors excel significantly across the five factors, respond to the needs of Kenya's energy sector, and can leverage their contributions for capital access to bring more capital to the sector.

Table 16: TII Index CAS Investor Typology

Category of Assessment	TII Index Score	Rationale
Status Quo (unsustainable)	≤ 0.65	Low and moderate scores across the five key factors.
Growth	$0.65 < \leq 0.75$	Perfect scores across the factors or substantial contribution across the key factors.
Sustainable	> 0.75	Excel across the five factors. Showing responsiveness to the sector's needs and gaps.

The average TII index score for off-grid private investments in Kenya is 0.51, below the cut-off mark of 0.65. Therefore, on average, the status quo of private investments in Kenya is unsustainable, further indicating that most investments are not responsive to the country's needs. Hence, a multifaceted view of capital access should be employed to advocate investments that reduce clustering and incentivise and reward actors keen on meeting the sector's needs. On a sectoral level, this approach encourages private sector governance practice that bolsters sustainable capital access and its integration into existing practices.

7.8 TII Index Limitation

Three key challenges limit the application of the TII index: transparency, data availability and governance. Although the law requires publicly traded companies to disclose their financial reports, private companies are entitled to greater confidentiality. It is the prerogative of private investors and energy companies to decide what information to disclose and to what extent. As a result, the capital and financial markets have an opacity that makes it difficult to penetrate or understand. The lack of transparency affects data availability. Most datasets essential for calculating different aspects of CAS may not be available. For example, although the interviewees stated that the capital that flows to Kenya's energy sector is expensive, the cost of capital was

not available in the quantitative dataset used and, thus, could not be factored into the index, affecting data completeness. This opacity means some investors may be more impactful but rank lower because of their lack of transparency. As such, related tools may also incentivise transparency among investors, with a shift of evaluation regarding their primary role of capital provision.

The final challenge is governance. Who determines the principles of CAS? Who is the custodian of the sustainability metric datasets? Who coordinates data collection, and who enforces it? The analogy of a seesaw was used to highlight the need to balance a country's requirements and gaps with those of investors, who, based on the findings, are strongly inclined towards profitability, which will ultimately lead to unsustainable and uneven investment outcomes. What constitutes the fulcrum of oversight? For effective operation and execution, this is a complicated problem that needs to be solved. However, academic and industry researchers can play an invaluable role in ensuring a reconciliation between the country's needs and the interests of investors.

7.9 Conclusion

Chapter 7 aimed to operationalise the findings of Chapters 4, 5, and 6, which provided the context for creating a TII index to evaluate CAS. Given the key finding of uneven investment outcomes coupled with other capital access gaps and needs, this chapter argued that capital access must be considered beyond the amount and type of capital provided, encompassing six principles: reach, relevance, frequency, sufficiency, affordability and adaptability. Given this empirical underpinning, CAS for Kenya's energy sector is defined as 'frequent and affordable capital flows that are adaptive, relevant and sufficient to the needs of the sector/industry, providing a broader reach of financial provision to companies or projects of different sizes or at different stages'. This definition is essential because it is contextually applied only to Kenya's energy sector to balance out the dominating interests of one group relative to others. Hence, this was operationalised using calculative practices to create a TII index.

Calculative practices enabled the study to combine different factors of CAS principles, demonstrated by creating an index and evaluating current private investments to illustrate CAS. Indices provide composite aggregate scores that are easily interpretable as units rather than as their separate constitutive elements. An index offers a broad understanding of how individual investors have provided capital and an average national score. The TII index also provides visibility to factors that the sole focus on quantum of capital access has long eclipsed. The index also advocates extending sustainability governance beyond the portfolio to the funds and investors, focusing on reconciling investors' interests with country and sector needs.

The evaluation results of the TII index confirm the capital needs, gaps and insufficiencies that led to uneven investment outcomes highlighted across the previous three Chapters: 4, 5, and 6. The results reveal that some investors are inconspicuous because their contributions are eclipsed by the typical focus on the amount of capital, whereas those lauded because of large investments have a limited impact clustered in a few companies and only continue to reproduce the status quo of uneven investment outcomes. As such, given the now long-standing practice of leveraging sustainability for more funding, this research argues that CAS should be leveraged to encourage sustainable capital flows.

Finally, similar or related TII index tools have industry applications and implications. First, it acknowledges the importance of existing sustainability metrics while highlighting the exclusion and vulnerability in assessing investors' contribution or impact in a sector. The TII index does not dispute the primacy of other sustainability metrics models, many of which capture CO₂ aversions and customer reach, but this is in addition to all those. Therefore, it can neither substitute nor relinquish existing impact models but supplement them. It is a leverage for capital access and would increase the right type of capital from investors who are responsive to the broader sectoral needs and gaps. It would incentivise frequent investors with keen engagement and interests in the sector who are willing to diversify across companies

of different sizes and have a broad market reach to provide sufficient and needed capital.

Chapter 8 : Conclusion

8.1 Overview

This thesis analyses the complexity of capital access for development and climate financing in the emerging markets. The analysis of actors, practices and relations enables the understanding of the uneven investment outcomes. Also, the analysis of factors that control investment decision-making supports recommendations for more sustainable investment practices at a sectoral and national level. Capital Access Sustainability (CAS) should follow contextual guiding principles founded on identified capital needs and gaps to leverage and incentivise actors to transform their practices. The aim is to dissuade a sole focus on the quantum of capital flows to the emerging markets and to provide instead a comprehensive outlook on capital access that may reduce uneven investment outcomes and encourage fairer capital access.

The research used financialisation as a theoretical lens to understand capital access in emerging markets, accepting that nationally and internationally, there is a proliferation and deepened penetration of the importance, role, and influence of financial market actors, practices and relations in the operation of economies (Aalbers, 2019; Epstein, 2005). Kenya and other countries in the Global South are embedded within the broader accumulation regime operating within the global capital circuits. This financialisation has further encroached on development financing. The private sector and profitability are now central to financing sustainable development goals and climate-relevant sectors, such as the energy sector. This private turn and the subservience of public financing to 'de-risk', 'catalyse' and 'mobilise' private financing has been termed a 'financialisation-centric development vision' (Bougrea, 2024; Mawdsley, 2018). Reliant on international capital sources to finance development and climate-relevant sectors, the emerging markets adopt financialised development and open up to its actors, practices and outcomes. Within this context, the emerging markets – subordinate, dependent and peripheral to the financialised economies –

draw international capital flows (Lapavitsas and Soydan, 2022; Bernards, 2024). Although the state and other national actors wield significant power and influence to enable financialisation through regulatory and legal frameworks, they have a circumscribed agency contingent on the country's position in the 'uneven hierarchy' of countries globally and often align with global narratives of development financing (Bonizzi, Kaltenbrunner and Powell, 2022).

This research examines capital access in emerging markets within the context of the financialisation and development nexus through a focus on three financial ecologies' facets: actors, practices and relations. Actors are the key stakeholders, mainly financial providers and recipients; practices are the rationale, logic, instruments, and measurements that financialisation actors use to provide capital, including calculative practices and; relations are the interactions and connections among the actors that further enable their actions in providing and receiving capital. It applies calculative practices of sustainability accountability to advocate for fair capital access to emerging markets.

This thesis contributes to the understanding of capital access in emerging markets. It reveals the actors, their influence, their practices and the consequential outcome of uneven investment. It also underscores the complex nature of capital access challenges provided within a financialised ecosystem, upon which all the emerging markets are embedded, and advocates for fair capital access through a broad outlook on capital access beyond the quantum. This chapter first returns to the research questions to summarise its key findings and then discusses the research implications.

8.2 Historical Trends: Who Are the Influential Actors Enabling Capital Access in Kenya's Energy Sector, and in Which Way Do They Invest?

Capital provided to emerging markets comes from two distinct broad categories of investors: public (international and national) and private (domestic and international). In a financialised development context, public funds are used to mobilise private financing to increase the quantity of capital flows (The World Bank Group et al., 2015;

Bernards, 2024; Mawdsley, 2018). This research answers the question in two parts, the first focusing on public international financing and the second on international private financing. Notably, public and private investors' expectations, roles, power and influence differ.

8.2.1 Energy Public Investment Trends and Gaps

Public investment analysis found that between 2000 and 2020, Kenya received ~US\$5 billion, which was primarily invested in renewable energy sources. Although Kenya attracted many investors (55), the majority (~90%) of this capital was provided by a small (10) number of investors. Analysis over these two decades revealed that the country's access to capital can be categorised into '*capital paucity*' and '*capital growth*' stages. The '*capital paucity*' stage, the period between 2000 and 2009, was a time of significant capital struggle, stemming from government requirements from international public investors in the energy sector. Investors demanded policy reforms to restructure the national energy utility companies, establish an independent regulator, and enable private sector participation and fair competitiveness in the energy market (Godinho and Eberhard, 2019). These requirements came from the MDBs, who have significant financial power and influence augmented by the emerging markets' historical financial reliance on capital to build large energy infrastructures (Newell and Phillips, 2016). Despite these regulatory reforms, investor confidence was slow to build. This delay was attributed to the lag between policy formulation and execution, investors' natural risk aversion and the slow adaptation of investors (Godinho and Eberhard, 2019). Notwithstanding these delays, the regulatory reform benefits were soon realised in the '*capital growth*' stage, starting in the 2010s.

The '*capital growth*' stage ushered in an era of more capital flows from multiple investors made through many investment deals. From the '*capital paucity*' stage, investors increased by 194% to 53, investment deals increased by 505% to 236, and capital increased by 1,274% to US\$4,504.28 million. Consequently, its energy generation and electricity connections have increased. While Kenya maintained early

investors, it also attracted new investors at this stage, indicating increased investor confidence, engagement, and interest in Kenya's energy market. Despite this vibrancy and engagement with multiple investors, power and influence are wielded by few, who are the movers and shakers providing the majority of the capital. These investors were mainly MDBs or public development banks (PBDs): DFC, JICA, Ex-Im Bank of China, IDA, European Investment Bank (EIB), AFD, IFC, KfW, JBIC, and AfDF. Although most of the capital they provided was mainly debt and mostly concessional, commercial-rate debt had the fastest growth.

Although capital was provided through diverse financial instruments, Kenya's energy market was heavily financed by debt, and alarmingly, it had a fast absorption of more expensive commercial-rate debt. From the end of the '*capital paucity*' stage to the end of the '*capital growth*' stage, the commercial rate debt increased by 6,157% and grew almost twice at a compounded annual growth rate (CAGR) of 51.47% relative to 25.62% of the concessional debt. This finding forms the basis for the argument that, while focusing on more capital flows is necessary, this cannot and should not be the only focus. How this capital is provided is equally important. The provision of expensive capital, coupled with foreign exchange risk for businesses operating in emerging markets with a clientele of low purchasing power, only lends itself to the intrinsic vulnerability of capitalistic accumulation. The emerging markets become an accumulation mining ground for net capital extraction. In the spirit of the collective goal of attaining SDGs, this is not only paradoxical but also counterproductive. Due to the high (perceived) risks, the emerging markets access more expensive capital that may lead them to 'debt entrapment', and the pursuit of development falls further among priorities as they seek the survival of debt repayment. Although other financial instruments provided notable and yet meagre contributions, this capital diversity must be encouraged. Equity, guarantees, grants, interest subsidies, and other hybrid instruments are useful for other capital financing needs. Guarantees may also have the potential to unlock the cautious and risk-averse local financial institutions. Grants also provide catalytic early-stage and non-commercial activities valuable to growing energy companies or projects.

Unfortunately, highly indebted national governments have a reduced capacity to support national energy utilities in accessing affordable capital. Using the example of KenGen, a national energy generation company, highlighted that capital guaranteed by the government was cheaper (KenGen, 2023). Kenya's government is not only highly indebted, but its debt is also above the set anchor debt limit (The National Treasury and Planning, 2023). The country's downgraded credit rating is exacerbating this issue, which means that the government accesses capital at a higher cost (CPI, 2024). Not only is capital now expensive for the government, but the set debt anchor limit also limits borrowing, and competing national needs further limit its role in securing cheaper capital for national public utilities (Michoud and Hafner, 2021). A weaker public domestic support and a cautious private sector allow a more prominent role for international public and private investors and, consequently, for IPPs, which currently play a significant supplementary role in energy generation. This situation is dire. With the inevitably diminished role of public domestic financing, there is a need to incentivise local financial institutions to provide financing for the energy sector.

Capital access in emerging markets evolves. Fortunately for Kenya, this has evolved from a '*capital paucity*' stage to a '*capital growth*' stage with more capital access from early and new investors. Notably, MDBs and PDBs are influential not only in the amount of capital they provide, which is the majority, but also in wielding a powerful influence that shapes energy sectors in emerging markets (Godinho and Eberhard, 2019; Widjanarko, 2024; Soloviov, 2023; Steffen and Schmidt, 2019). Given the emerging markets' reliance on international financing and their subordination, they mostly acquiesce to these demands. Although emerging markets view access to more capital as a celebratory feat, less focus has been on its cost and the nature of the capital. This narrow focus has led to a fast absorption of commercial rate debt, which is more expensive and may lead countries to debt entrapment. Capital access challenges persist, especially foreign exchange risk coupled with the risk averseness of the local financial institutions. Most worrisome is that although the national governments are instrumental in providing cheaper capital to national utilities, this is diminished by

more indebted governments in the Global South. This situation, at the very least, opens up a more prominent role for private sector participation in the energy sector and, at worst, results in more expensive energy due to the increased pass-through cost charged to Kenyan citizens (Saitet and Muchemi, 2015). Notwithstanding the vaunted role of public investors in attracting and mobilising private investments, the next section details the investment outcomes (trends and patterns) and relations among the actors.

8.2.2 Energy Private Investment Trends and Gaps

The analysis of international private investors' practices between 2012 and 2022 shows investment trends, dominant actors and their characteristics, the nature of the investments and the capital access pathways. The actors regarded Kenya as both the '*epicentre*' and a '*regional finance centre*' of the off-grid sector due to the Pay-Go technology normatively adopted by the off-grid sector and the country's high mobile ownership and SIM card subscription (MOEP, 2024). This, in turn, led to the clustering of actors (investors, lobbyists, industry associations, researchers) in Nairobi, facilitating more frequent engagement and relationship-building between the actors and the companies operating in Kenya. Due to the close spatial proximity, companies operating in Kenya have raised more capital than those in neighbouring countries. The energy access numbers also reflect this success. Between 2009 and 2019, the use of SHS as the primary lightning source grew from 1.62% to 19.3% in 2019, surpassing the Kenya National Electrification Strategy (KNES) projection by 20% (KNBS, 2009; KNBS, 2019; MOEP, 2018). Despite this progress, the country did not achieve universal energy access in 2022, as planned in the KNES. This thesis investigates capital provision among its actors, investors and recipients (energy companies).

This research found that a few large international companies successfully raised capital, while many small (and local) companies struggled. This outcome supports Baker's (2023) findings that the emerging markets' off-grid sector is increasingly monopolised by international companies supported by international public and private finance. There is an outstanding uneven distribution of capital between the

large, internationally linked companies and the small and medium-sized local ones. In Kenya, 13.5% of the off-grid companies received 83.57% of the total investment, all at the scale-up stage, whereas 86.5% (start-up and seed-stage companies) competed for 16.43%. Analysing the skewness of capital access, this study found that the amount of capital received by a company was directly related to the size of the company, the number of investors and the frequency of the investment deals. A few large international companies had an investment appeal that attracted substantial investments from multiple investors who would invest and make investment deals frequently.

While this was notable, a more compelling finding was the role of relationships between investors and energy companies in accessing capital. First, there was the ability to leverage existing relationships for subsequent investments, and second, using the same relationships as linkages to new potential investors. The former signals strong investor confidence and commitment to provide subsequent investment due to the reduced information asymmetry. The subsequent investment is made by an insider instead of an outsider, and this time, with more knowledge of the company than during the first investment. Having more investors as 'insiders' and other relationships were additional advantages. This advantage is further augmented by the significant finding in this thesis that referrals are the most effective mode of capital access. Hence, these 'insiders' become connectors to other potential new investors because new investors are more inclined to trust the referee due to their insider perspective, which increases their investment confidence. This finding implies that, because of relationships, the conspicuousness and connections of the few large international companies to investors lead to more effective capital raising, whereas the obscurity of the overlooked small local companies means they struggle to raise capital. Having discussed this, the thesis turned its analysis to the type of capital provided by international private investors.

Although most of the capital provided was equity, its dominance has declined over the years, and debt is fast growing. In the later years, debt capital doubled its investors

and quintupled its investment deals. Notably, equity financing is consolidated among a few large companies and, as a result, despite its lead in capital, it is a rarity for most companies. Hence, most companies are stuck between what is available (mostly debt) and what they need (equity and grants). This concentration of equity financing is influential in the growth of companies because it has a plethora of advantages in general, and capital access. Grants have been meagre, and applications have been frequently declined. The most desired type of finance, equity and grants, is consolidated on a few companies, and there is a surge of debt financing, which small companies are ineluctably leaning towards. This finding reveals the need to increase the quantity of rare capital. However, the analysis of the role and utility of different types of capital reveals the depth of this challenge and the capital gaps.

An energy company's growth, success and expansion are contingent on the type of capital it has access to due to its varied role and utility. There were three key findings in this research. First, in addition to providing operational capital, equity financing helps leverage additional (debt) capital; equity investors are also generous in their industry experience, advisory and networks, providing additional support, such as technical assistance, and are integral in providing oversight and contributing to a company's key decisions. They are the ultimate 'insider' and perhaps the best referees for new investors. Companies strongly desire this type of capital. Second, the sharp decline of grant financing heavily impacts small companies that rely on it for both commercial and non-commercial activities, such as studying new markets and customer acquisition, expanding to new geographical regions and reaching underserved populations. These factors reduce the cost of products, among other benefits. Third, companies raise debt to finance their operations, growth and expansion. Investors' proclivity towards debt due to risk aversion and the gradual decline of grants that have not prioritised small companies' urgent and significant needs further exacerbate the capital needs and gaps. Actors highlighted that they prefer to provide debt because it is less risky, has less tedious due diligence, and has less engagement. The decline in grants is subject to circulation and transformation. The decline of direct grants is attributable to services provided through indirect grants

and grants transformed into other financial instruments, such as debt. This reveals the need for direct grants to address pertinent issues, such as skills gaps in most small companies. Grants are currently failing to address these issues.

Finally, the actors highlighted the need to advocate and motivate investors to provide guarantees. More guarantees would encourage existing investors to provide more capital speedily while drawing capital from new investors. Most importantly, guarantees have the potential to catalyse capital from local financial institutions and more risk-averse insurance and pension schemes and to revitalise the trailing green bond market. This point is significant because foreign exchange risk is among the top stressors for entrepreneurs in Kenya (Flourish Ventures, 2024). Guarantees offer a safety net to investors, reducing their downside risk and increasing their confidence. Given the uneven investment outcome resulting from international private investments, the next research question focuses on how this situation comes about and the practices and factors controlling or influencing this outcome.

8.3 Facilitating Investment Access: What Factors Control Investment Decision-Making for Energy Investments in Kenya?

To further understand the consolidation and clustering of capital and actors among the few companies while many struggle, this research question examines how the practices of financialisation actors, mainly investors, influence their investment decision-making and what factors control or influence it. This research found that two categories of factors influence the amount and investee selection: intrinsic and extrinsic factors. Intrinsic factors are those that investors evaluate in an energy company during due diligence to assess their investability. These factors are financial performance, management, business model and the company stage. Extrinsic factors are exogenous factors outside the control of energy companies or even investors that determine general capital flows in a country or the investments in a company. These are stability of the regulatory environment, overall availability and affordability of capital, compliance in reporting sustainability metrics and partnerships and collaborations among the investors.

Current profitability and its future potential are the primary investor considerations. Assessing other intrinsic factors is then imperative in determining the ease and certainty of achieving profitability. The financialisation-centric development that brings the private turn has shifted aid to investment and transformed aid recipients into investees. Investees, by nature, must be profitable to generate returns for their investor. Hence, this model of providing capital privileges profitability (Bougrea, 2024). Hence, this focus on profitability confirms why investors' practices inevitably cluster their capital in a few large companies due to risk aversion. The prevalence of management skills gaps in small companies, their lack of financing to address these gaps and high expectations for a substantial '*skin in the game*' reveal why they can hardly compete with large companies. The expectations of international private finance are too high, and the support to meet them is meagre, locking them in an inescapable 'unprofessional loop'.

Globally, the emerging markets in SSA are perceived as riskier. Investors are more risk-averse and, when they invest, the cost of capital is higher (Alami and Guermond, 2023). Investors expect higher returns from SSA than from other regions. Therefore, this risk (perception) reduces the volume of capital flowing to SSA. This has resulted in some large companies using SPVs to access additional capital to operate in SSA. Nationally, the volatility of policies contributes to higher risk perception, further deterring investors. Overall, this volatility negatively affects a country's investment cost, speed and flow. Partnerships among investors increase the effectiveness of a company's capital raising, affecting the amount and the speed at which they may receive it (Turkelli, 2022). Finally, the conditionality of reporting on sustainability metrics tied to international capital flows is, at times, too costly for small companies or they may lack the expertise to undertake it.

Commercial success is at the heart of the financialisation-centric model of financing development. Because of the private turn and the privileged profitability, uneven investment outcomes are inevitable. These findings show that the rationale, logic and

practices of financialisation actors further permeate the financing of climate-relevant sectors. These actors cluster around the few companies perceived to have the capacity to deliver less risky, profitable returns.

8.4 Investing Sustainably: What Kinds of Investments Promote Sustainability in Capital Access?

Answering this research question and illustrating the kind of investments that promote sustainability in capital access draws from the rich empirical findings of the previous research questions. These findings problematise the normative capital access focus for the emerging markets; define and contextualise sustainability for capital access; and utilise and leverage the normative calculative practices of sustainability accounting to illustrate and advocate for fair and broader capital access.

Cumulatively, this thesis found that financing through the financialisation-centric model inevitably results in uneven investment outcomes that may exacerbate the dependency of emerging markets. Most importantly, the model's focus on leveraging public finance to increase the quantum of capital flows to emerging markets is narrow and misses other capital gaps and needs (The World Bank Group et al., 2015; Bernards, 2024). More expensive capital flows to the emerging markets privilege the selection of internationally connected actors who are prioritising higher returns. This aspect constitutes capital extraction within the broader regime of accumulation and fails to consider 'sustainability for capital access'.

This thesis defines sustainability for capital access as investment strategies that result in balanced local and international capital access that can perpetually grow or improve while having a net positive outcome for capital providers, recipients and the broader citizenry. This general definition covers the broader sustainability of capital access in emerging markets. Following the identified capital needs and gaps identified from the empirical findings, at a contextualised spatial unit, this sustainability ought to be built upon six principles to enable assessment. These six principles are reach, relevance, frequency, sufficiency, affordability and adaptability. Capital access

sustainability (CAS) can assist in the operationalisation of calculative practices and create an index to illustrate this assessment within the context of energy sector financing in Kenya. CAS is defined as: *‘frequent and affordable capital flows that are adaptive, relevant and sufficient to the needs of the sector/industry, providing a broader reach of financial provision to companies or projects of different sizes or at different stages’*.

The finding that capital flows follow sustainability metrics highlights the normative practice by financialisation actors of using and leveraging them to access more and cheaper capital. However, these metrics have mainly focused on the achievements of energy access and climate metrics from the energy companies, and none have focused on the sustainability of the capital access in and of itself. Hence, the primary role of investors has been excluded, and this thesis advocates for its monitoring, evaluation and assessment. To illustrate this, this thesis creates an illustrative index, TII, to demonstrate that a focus on quantum only is narrow and eclipses other capital needs and gaps. Most importantly, it shadows the contributions of the financialisation actors who cater to these needs. These actions ought to be brought to the fore and leverage the capital flows to actors who collectively address most capital needs, even when they are not the biggest capital providers. Considering all the factors available for evaluation, this thesis found that inconspicuous investors with positively impactful investment strategies that do not reproduce the status quo would be invisible. Given the long-standing practice of leveraging sustainability for more funding, this research argues that CAS and indices should be leveraged to encourage sustainable capital flows. With modifications, this approach can be used as a tool with industry application in emerging markets to supplement existing sustainability metrics.

8.5 Research Implications

8.5.1 A Deepened Subordination and Dependency of Emerging Markets on International Public Funding

The findings in this thesis postulate that capital access for the emerging markets to finance development and climate-relevant sectors has been and will continue to be subordinate to that of financialised economies and international financial institutions.

This result aligns with the findings of Bernard's (2024), Lapavistas and Soydan (2022), and Powell (2013). Historically, international public financial institutions have wielded an influential power and role in providing significant capital and shaping the energy sector (Steffen and Schmidt, 2019; Soloviov, 2023; Widjanarko, 2024). In the past, this subordination was evidenced by the emerging markets acquiescing to the demands of the public investors. Evidently, the financing of development and climate-relevant sectors in emerging markets flows from powerful actors, and they shape the energy markets. Hence, this is not a mutual alignment of independent and intrinsic interests and goals.

Although emerging markets may now receive more capital flows, owing to the global collective efforts on SDGs and climate action, the role of domestic national governments has been weakened by the debt distress many are in. Assessing the state of climate finance in Africa, the Climate Policy Initiative (CPI, 2024) reports that the International Monetary Fund (IMF) data show the following in SSA emerging markets: 28 countries are debt distressed, 10 are at high risk of being distressed (including Kenya), and 17 countries have had downgraded credit since 2020 (including Kenya). Many emerging markets in the SSA are either on the verge of or in debt entrapment, which is a precondition for economic crisis, according to Dym'ski (2018). Besides fragile economic systems on the brink of crisis, this situation has several other implications.

The relational power of emerging markets to those of financialised economies continues to widen. Power is diminished in emerging markets and ever-growing in financialised economies. Consequently, the dependency of emerging markets is increasing. Scholars such as Cipler et al. (2022) and Lai (2025), have debated whether financing climate-relevant sectors under the current provision and networks advances climate justice or increases dependency. The cost of capital is increasing due to a high (perception of) risk (as risk-distressed countries). Not only does the capital become expensive, but the foreign exchange risk also increases due to currency devaluations. These factors limit the government's borrowing and its capacity to finance the energy

sector due to competing development interests (Michoud and Hafner, 2021). The real effects are experienced by public national utility companies, which not only had access to more capital from investors averse to providing capital directly to them, but also received cheaper capital due to government guarantees. These aspects may lead to further expensive electricity costs. Saitet and Muchemi (2015) have mentioned that domestic public financing for high-risk stages of technologies, such as geothermal energy, is key in reducing the pass-through costs to citizens.

There is a broader conversation about the debt-distressed emerging markets in Africa, which is an accumulation site for capital extraction. This thesis found that international public investors overwhelmingly financed emerging markets in SSA through debt and increasingly provided this at the commercial or market rate. This finding aligns with CPI (2024) research that found that debt financing for climate-relevant sectors in SSA was twice that of Latin America, the Caribbean, East Asia, and the Pacific regions. What is more worrisome is that the CPI (2024) reports that international public investors, such as MDBs and DFIs, provided 82% of climate finance commercial rate loans. This information reveals the incongruence between the global narratives of financing SDGs and its execution. Given that the financialised development narrative highlights the need for public financing in catalysing private investment, the subtext is the assumption of cheaper capital from PBDs. That assumption is not valid. The struggling emerging markets fund their development with more expensive capital and fund it in a manner that may only exacerbate its economic subordination. Although countries such as Kenya have benefitted in some ways through increased energy access and generation, the prevailing concern about the sustainability, vulnerability and fragility of emerging markets is exacerbated by how this is financed. This situation calls for a focus beyond the focus on debt. There is a need for impassioned advocacy for a diversity of other catalytic financial instruments, such as guarantees and grants, that may incentivise the local financing institutions to provide capital in local currency, eliminating some of the risk factors for the energy companies. If financing must be debt, concessionality is imperative.

8.5.2 The Uneven Investment Outcomes of Private Financing

Although the financialised development narratives emphasise leveraging public funds for private investments to increase the quantity of investment, this is not a silver bullet and capital needs and gaps persist. This thesis finds that these investments proliferate financialisation practices of extractive capital accumulation from the Global South and, most importantly, expose the uneven investment outcomes between small and large international companies. It highlights the coign of vantage of relations and connections among the actors in accessing this capital.

The consolidation of the most desired and catalytic capital in a few large international companies indicates the use of emerging markets as a site for extracting financial returns (Simo and Ndifor, 2025). International private capital, mobilised by international public finance, flows to international energy companies that serve local energy markets. These companies gain profits, which are ultimately transferred to international investors. This situation is not the result of international companies receiving this capital, but because of the extent and scale to which they receive it. The scale is substantially uneven and leans heavily on one side, emphasising the subordination of local companies in accessing this capital. However, this is neither new nor concealed, but its effect has been under-discussed. Bougrea (2024, p. 21) has highlighted that PDBs, such as the EIB, provide international public funding for the purposes of their geopolitical objectives. They are mainly aiming to counter the geopolitical influence and competition in SSA through an evening out of 'the playing field for European businesses' competing with other international public finance providers in the emerging markets. In Kenya, this finding also agrees with Klagge and Nweke-Eze(2020), who established that LTWP, financed in part by the Netherlands and Denmark, used their public finance to support private companies from their countries, assisting them in exporting their products and technology to Kenya. This cements the finding that international public finance mainly serves its economic and political interests through international private companies and focuses less on the local companies. In these circumstances, it is not surprising that there is an uneven investment outcome.

Although these international companies serve the local markets and bring about energy benefits, this is only a tiny part of the broader development goals. Supporting struggling local companies would increase the country's capital retention. This retention is imperative as development and climate-relevant sectors are financed through the broader pursuits of SDGs to attain development and increase the well-being of the Global South. This thesis argues that there is a need for more balance in the uneven investment outcomes observed in emerging markets.

Financialisation accumulation is further evidenced by the increase of debt capital, which, although necessary, must be supplemented with a range of diverse financial instruments to reduce uneven investment outcomes. The increase of debt in emerging markets and its vulnerabilities is emblematic of the growth of financialisation in general, which scholars, such as Christopherson (2013) and Dymski (2018), warn against. Coupled with the volatility of currency devaluation and the vulnerability of foreign exchange risk that emerging markets bear due to their subordination, there is a need to mobilise the local financial markets. This mobilisation would reduce the hegemony of large companies and open up sources of capital that are less competitive and more familiar to local companies. Some of these struggling companies already rely on local financing and already have connections with them, whereas, on the international stage, many are obscure. International public finance should be used in part to provide financial instruments, such as guarantees, to catalyse local finance, encourage additional new local investors and revitalise a trailing green bond market.

There is no doubt that small local companies are disadvantaged due to their weak links and connections to the international capital circuits. Strong relations among the financialisation actors are imperative. Cognizant of this finding, the development financing should find ways to catalyse local financial markets that are more accessible to local companies. They, too, have a key role in energy access, and most importantly, they contribute to broader capital retention in the country. The financialisation-centric model of financing development is flawed and uneven and only caters to a small part

in achieving SDGs in emerging markets. The overt success story of capital access in Kenya is also a covert failure. It is a tale of access to capital, but its sustainability is a second thought.

8.5.3 Financialisation Practices Privileging Profitability Results in Clustered Uneven Investment Outcomes

Investors perceive the emerging markets in SSA as riskier. This perception naturally deters many from providing capital and those that do require higher returns. Additional factors, such as the volatility of policies, exacerbate this risk perception. Investors inexorably select companies with the most significant potential to deliver high returns. As a result, they cluster their capital among a few large international companies.

This finding reveals that the private turn and profitability at the core of the financialisation-centric model are inharmonious with even capital access. The profitability expectations of international private finance and the ability of the small local companies are unmatched. The severe skills gaps in management and, at times, in sustainability metrics reporting, coupled with uncertain current and future financial performance, indicate risk beyond levels that investors can accommodate.

The pursuit of profitable companies that offer high returns expected from the SSA emerging market is consistent with the findings of Aalbers (2019) and Grafe and Mieg (2019) at the corporate level, where the goal is to achieve maximum profitability for investors. Other scholars have observed that investors in the financial markets expect higher returns than those in real production, which further highlights the strong skewness to potentially profitable large companies (French, Leyshon and Wainwright, 2011; Froud et al., 2000).

Notably, the comradeship among (international and local) actors on financing development and climate-relevant sector investments was never despite profitability but in addition to profitability, especially in attracting private investments. The

normative discourse has highlighted the links between SDGs, sustainability and ecological responsibility with profitability (Simo and Ndifor, 2025; Ogunsola et al., 2024; Sun et al., 2024; Ameli et al., 2020; Pyka and Noco, 2021; Claringbould, Koch and Owen, 2019). Private investors never relinquished profitability pursuits but transferred those pursuits to climate-relevant sectors. They termed it a more ‘responsible or sustainable’ investment. Perhaps here lies the vulnerability that needs to be rethought or, rather, its execution needs to be reconsidered. First, awareness of the unevenness of normative financing approaches needs to be raised. Second, more sustainable capital access should be advocated for. One of the leverage areas is the utilisation of some of the international public financing in mobilising local finance accessible to small local companies. With a private turn in the financialisation-centric model of financing development, profitability remains a core concern. To counter skewness, the following section proposes using normative calculative practices in sustainability accounting to balance the unevenness and cater to persisting gaps and needs.

8.5.4 Incentivising Financialisation Actors for Capital Access Sustainability

For more than two decades, emerging markets have pursued international financing for their development and, most recently, to address climate change. Despite these flows, the emerging markets find themselves highly indebted, with fewer public resources. They are still subordinated and dependent on global capital circuits. In addressing the effects of the financialisation-centric model of financing – uneven investment outcomes, accumulation, and subordination in currency hierarchies – existing normative calculative practices must be transformed into tools that incentivise actors to sustainably provide capital in the emerging markets. First, this is to bring to the fore the discussion of the reconceptualisation of capital provision in emerging markets, and second, to reimagine pathways of operationalising this reconceptualisation as a tool to leverage sustainable capital access.

This thesis proposes a contextual assessment of regional, national or sectoral capital needs to identify the gaps and needs. These can be used to form the principles of CAS relevant to that context. The definitions of capital access must not only be contextual

but also dynamic. This is to ensure that the real capital needs are addressed. Given the uneven investment outcomes, this research proposed that capital access may be accessed through six principles emblematic of the underlying capital needs in emerging markets: reach, relevance, frequency, sufficiency, affordability and adaptability. Beyond the theoretical reconceptualisation of capital access is the practical industrial application to incentivise the modification of actors' practices.

This thesis established that sustainability metrics and their reporting are key factors in capital access. They are tools for accessing more and cheaper capital (Hiss, 2013). The broadened CAS can be operationalised through normative calculative practices that integrate these principles into an index to assess and reward those who invest sustainably or challenge the status quo of uneven investment outcomes. This thesis has demonstrated that such sustainability pursuits for capital are invisible due to the normative focus on the quantum of capital.

Finally, this situation presents an opportunity to provide new sustainability metrics that may supplement existing ones. Most importantly, it introduces and includes investors' primary role in actionable sustainability metrics. Recognition of this role encourages the continuous assessment and transparency of how capital is provided to emerging markets. This recognition could incentivise more sustainable capital provision.

8.6 Future Research

This thesis recommends further research that captures differentiated and contextualised assessment of capital needs in emerging markets. While this research revealed covert capital access challenges, it drew its lessons from the energy sector, which is the most financed climate-relevant sector. There is a need to extend the same examination to other sectors.

Calculative practices should be operationalised through the use of statistical analysis that utilises qualitative contextual analysis, but with objective statistical weighting.

Since the TII index created here is an illustrative index, this is the next step in this work.

1. Appendix A: TII Index Scores

Table 17: Transformative Investment Impact (TII) Index Rank⁴⁸

Investment Amount Rank	TII Index Rank	Name of the Investor	Year of Earliest (recorded) Investment	No. of Deals	No. of Investees	Total Amount of Investment	Equity	Debt	Grant	Seed	Start-up	Scale-up	TII Index (Average)
1	42	General Atlantic, M&G, Leapfrog, Arch EM	2022	1	1	330000000.00	100%	0%	0%			100%	0.53
2	46	Solar Frontier Capital (SFC)	2020	2	1	121995598.00	0%	100%	0%			100%	0.51
3	17	Responsibility Investments	2017	5	4	69000000.00	0%	100%	0%		6%	94%	0.69
4	21	Apis Partners	2017	2	1	60000000.00	50%	50%	0%			100%	0.64
5	25	Investec Bank	2016	3	1	58418750.00	100%	0%	0%			100%	0.60
6	20	European Investment Bank	2018	2	2	52500000.00	0%	100%	0%			100%	0.65
7	32	Mitsubishi Corporation	2019	1	1	50000000.00	100%	0%	0%			100%	0.56
8	18	Eastern and Southern African Trade and Development Bank (TDB)	2021	5	2	49200000.00	9%	91%	0%		9%	91%	0.69
9	8	FEI OGEF (Nordic Development Fund, African Development Bank and Lion's Head Global Partners)	2018	7	4	46066033.00	0%	100%	0%		27%	73%	0.73
10	1	FMO	2015	4	4	36965298.00	62%	38%	0%		5%	95%	0.84
11	4	ENGIE Rassembleurs d'Energies	2015	5	3	35000000.00	100%	0%	0%		9%	91%	0.79
12	15	SunFunder	2016	9	5	33269570.00	0%	100%	0%		89%	11%	0.70
13	28	Inspired Evolution II	2018	2	1	33000000.00	100%	0%	0%			100%	0.58
14	6	Norfund	2017	4	2	32181818.00	31%	69%	0%			100%	0.74
15	33	AIIM (Africa infrastructure Investment Managers)	2019	1	1	31000000.00	100%	0%	0%			100%	0.56
16	5	Kawisafi Ventures (Acumen)	2016	5	4	29860000.00	100%	0%	0%		67%	33%	0.78
17	34	Marubeni Corporation	2019	1	1	26000000.00	100%	0%	0%		100%		0.56

⁴⁸ The datasets used to assess CAS using the TII index were provided by GOGLA. Cited as: GOGLA, Investment Database (2012-2022). The amount of investment analysed here does not reflect the total amount of capital provided by the individual investors in Kenya, but only the investment information that was public or reported as non-confidential to GOGLA by the investors.

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Investment Amount Rank	TII Index Rank	Name of the Investor	Year of Earliest (recorded) Investment	No. of Deals	No. of Investees	Total Amount of Investment	Equity	Debt	Grant	Seed	Start-up	Scale-up	TII Index (Average)
18	7	Energy Access Ventures	2016	2	2	24000000.00	100%	0%	0%		58%	42%	0.74
19	2	unknown	2015	5	4	22299900.00	100%	0%	0%		72%	28%	0.82
20	44	CDC Group	2017	1	1	21818182.00	0%	100%	0%			100%	0.52
21	11	Trine	2016	37	9	20294756.00	0%	100%	0%	9%	9%	82%	0.71
22	38	Finnfund	2016	2	1	19598750.00	0%	100%	0%			100%	0.54
23	12	LGT Group	2015	4	1	19450000.00	59%	41%	0%			100%	0.71
24	24	Generation Investment Management	2015	1	1	19000000.00	100%	0%	0%			100%	0.61
25	3	Oikocredit	2012	4	3	15521261.00	80%	20%	0%		97%	3%	0.81
26	43	PIDG	2022	1	1	15000000.00	100%	0%	0%			100%	0.53
27	48	Standard Bank	2022	1	1	15000000.00	0%	100%	0%			100%	0.49
28	49	Symbiotics	2021	1	1	15000000.00	0%	100%	0%			100%	0.49
29	13	Khosla Impact	2013	3	1	13600000.00	61%	39%	0%			100%	0.71
30	19	Emerson Collective	2017	2	2	13300000.00	100%	0%	0%		100%		0.68
31	22	Nithio	2022	4	4	12750000.00	0%	100%	0%	2%		98%	0.64
32	14	KfW - DEB	2012	3	1	12514050.00	63%	32%	5%			100%	0.70
33	26	Novastar Ventures	2014	2	1	11657000.00	100%	0%	0%		100%		0.59
34	16	Energise Africa (a JV between LH and Ethex)	2018	34	5	11595737.00	0%	100%	0%	1%	74%	25%	0.69
35	35	DJF Venture Capital	2014	1	1	11000000.00	100%	0%	0%			100%	0.56
36	65	EIB	2022	1	1	10514576.00	0%	100%	0%			100%	0.43
37	27	OPIC	2016	2	2	10000000.00	0%	100%	0%			100%	0.59
38	39	Fidelity Growth Partners India	2015	1	1	10000000.00	100%	0%	0%			100%	0.54
39	52	FinDev Canada	2018	1	1	10000000.00	100%	0%	0%			100%	0.49
40	57	Proparco	2021	1	1	10000000.00	100%	0%	0%			100%	0.46
41	66	EEGF	2022	1	1	10000000.00	0%	100%	0%		100%		0.42
42	62	Stanbic Bank	2017	1	1	9818182.00	0%	100%	0%			100%	0.45

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Investment Amount Rank	TII Index Rank	Name of the Investor	Year of Earliest (recorded) Investment	No. of Deals	No. of Investees	Total Amount of Investment	Equity	Debt	Grant	Seed	Start-up	Scale-up	TII Index (Average)
43	50	Commercial Bank of Africa	2014	1	1	9632000.00	0%	100%	0%			100%	0.49
44	41	Rose Park	2022	4	1	8551200.00	47%	53%	0%		100%		0.54
45	9	Bamboo Finance	2012	4	3	8000000.00	100%	0%	0%		38%	63%	0.73
46	63	Swedfund	2018	1	1	7500000.00	100%	0%	0%			100%	0.44
47	70	Developing World Markets	2016	1	1	7500000.00	0%	100%	0%			100%	0.40
48	68	Power House Ventures	2021	1	1	7000000.00	100%	0%	0%		100%		0.41
49	23	USAID's Development Innovation Ventures (DIV)	2013	6	4	6083000.00	0%	0%	100%		55%	45%	0.63
50	67	IFC	2016	1	1	5999398.00	100%	0%	0%			100%	0.42
51	51	Shell Foundation	2016	2	2	5850000.00	0%	0%	100%			100%	0.49
52	45	Power Africa, USAID	2017	3	3	5805000.00	0%	0%	100%		2%	98%	0.52
53	58	D.O.B. Foundation	2012	1	1	5800000.00	100%	0%	0%	100%			0.46
54	53	The Social Entrepreneurs Fund	2013	2	1	5500000.00	100%	0%	0%		100%		0.48
55	61	Bloomberg Philanthropies	2014	1	1	5000000.00	100%	0%	0%		100%		0.45
56	69	Bill and Melinda Gates Foundation	2014	1	1	5000000.00	0%	100%	0%			100%	0.41
57	76	Deutsche Bank	2017	1	1	5000000.00	0%	100%	0%			100%	0.36
58	77	Standard Chartered	2017	1	1	5000000.00	0%	100%	0%		100%		0.36
59	80	AGGF	2022	1	1	5000000.00	0%	100%	0%			100%	0.33
60	72	DFID	2014	1	1	4600000.00	0%	0%	100%			100%	0.38
61	75	FSD Africa Investments	2021	1	1	4500000.00	100%	0%	0%	100%			0.36
62	78	Union Togolaise des Banques	2018	1	1	4032597.00	0%	100%	0%			100%	0.34
63	79	Electrification Financing Initiative (ElectriFI)	2018	1	1	4000000.00	0%	100%	0%		100%		0.34
64	10	DOEN Foundation	2012	7	4	3762271.00	58%	35%	6%	9%	21%	70%	0.72
65	54	MasterCard Foundation Prosperity (FRP)	2016	2	2	3240000.00	0%	0%	100%		23%	77%	0.47
66	29	Zayed Future Energy Prize	2012	3	3	3100000.00	0%	0%	100%		32%	68%	0.57
67	87	Swedish Embassy	2017	1	1	3000000.00	0%	0%	100%			100%	0.30

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Investment Amount Rank	TII Index Rank	Name of the Investor	Year of Earliest (recorded) Investment	No. of Deals	No. of Investees	Total Amount of Investment	Equity	Debt	Grant	Seed	Start-up	Scale-up	TII Index (Average)
68	37	EEP Africa	2019	5	5	2888420.00	0%	0%	100%	53%	8%	39%	0.54
69	36	Barclays	2013	2	2	2663832.00	0%	59%	41%		100%		0.54
70	31	Africa Enterprise Challenge Fund (AECF)	2012	3	3	2400000.00	0%	0%	100%		42%	58%	0.56
71	40	Angel investor	2012	2	2	2400000.00	100%	0%	0%			100%	0.54
72	30	GSMA Mobile for Development Utilities	2013	8	7	2263041.00	0%	0%	100%	25%	11%	64%	0.57
73	81	Rise Fund	2020	1	1	2250000.00	100%	0%	0%		100%		0.32
74	56	Lendahand	2017	15	2	2216348.00	0%	100%	0%		100%		0.47
75	86	Banque Populaire du Rwanda	2017	1	1	2000000.00	0%	100%	0%			100%	0.30
76	73	Gray Ghost Ventures	2014	1	1	1000000.00	100%	0%	0%			100%	0.38
77	88	Aruwa Capital Management	2022	1	1	1000000.00	100%	0%	0%		100%		0.30
78	47	Lendable	2017	3	2	905000.00	0%	100%	0%	61%	39%		0.51
79	64	Ceniarth, LLC	2016	2	2	750000.00	0%	0%	100%	33%	67%		0.44
80	55	Acumen	2021	2	2	625000.00	80%	20%	0%		100%		0.47
81	90	Sima Funds	2018	1	1	600000.00	0%	100%	0%	100%			0.28
82	59	Bettervest	2019	2	2	517289.00	0%	100%	0%	38%	62%		0.46
83	60	Kiva International	2017	5	3	500000.00	0%	100%	0%	10%	90%		0.46
84	91	All On	2022	1	1	500000.00	0%	100%	0%		100%		0.25
85	92	Build Fund (Bamboo Capital Partners)	2021	1	1	500000.00	0%	100%	0%	100%			0.25
86	93	Bpifrance	2022	1	1	420583.00	0%	100%	0%		100%		0.25
87	74	Synergy Growth	2013	1	1	400000.00	100%	0%	0%			100%	0.36
88	82	Kickstarter	2015	1	1	294000.00	0%	100%	0%		100%		0.32
89	84	MTN	2017	1	1	250000.00	100%	0%	0%			100%	0.31
90	85	Eureeca	2019	1	1	156654.00	100%	0%	0%		100%		0.31
91	83	Beyond Capital Fund	2014	1	1	150000.00	0%	100%	0%		100%		0.32
92	89	PG Impact	2022	1	1	150000.00	100%	0%	0%		100%		0.29

Investment Amount Rank	TII Index Rank	Name of the Investor	Year of Earliest (recorded) Investment	No. of Deals	No. of Investees	Total Amount of Investment	Equity	Debt	Grant	Seed	Start-up	Scale-up	TII Index (Average)
93	71	Energy Access Booster	2018	2	2	100000.00	0%	0%	100%	100%			0.39
94	95	Innovate UK	2022	1	1	95937.00	0%	0%	100%		100%		0.22
95	94	CrowdCredit	2020	1	1	92000.00	0%	100%	0%		100%		0.24

2. Appendix B: International Public Investments in Renewable vs. Non-renewable energy Technologies

Table 18: International Public Investments in Renewable vs. Non-renewable energy Technologies in Kenya

Non-renewable energy	450.3191843	9.32%
Renewable Energy	4381.893285	90.68%
Total Investment	4832.212469	

3. Appendix C: KPLC Energy Purchase (2012-2023)

Table 19: KPLC Energy Purchase (2012-2023)

KPLC Energy Purchase (GWh)											
Company/Group of Companies	2012/2013	2013/14	2014/115	2015/16	2016/2017	2017/2018	2018/19	2019/20	2020/21	2021/22	2022/23
KenGen	73.81%	67.09%	74.81%	78.69%	73.62%	74.65%	72.00%	71.86%	69.77%	62.52%	60.39%
Independent Power Producers (IPP)	22.11%	30.52%	23.27%	19.70%	24.17%	23.31%	25.49%	25.41%	27.35%	33.60%	33.55%
Government of Kenya (Rural Electrification Programme)	0.33%	0.35%	0.39%	0.42%	0.40%	0.44%	0.50%	0.52%	0.54%	0.56%	0.56%
REREC Garissa Solar Plant	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.52%	0.79%	0.71%	0.65%	0.65%
Imports	0.52%	0.98%	0.85%	0.68%	1.80%	1.60%	1.48%	1.40%	1.63%	2.67%	4.85%
EPPs	3.23%	1.06%	0.68%	0.51%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

References

- Aalbers, M. (2019). Financialization.
- Ababneh, T. and Ağa, M. (2019). "The Impact of Sustainable Financial Data Governance, Political Connections, and Creative Accounting Practices on Organizational Outcomes". *Sustainability*.
- AGECC, T. and UN Secretary-General's Advisory Group on Energy and Climate Change (2010). Energyfor a Sustainable Future. Report and Recommendations.
- Alami, I. and Guermond, V. (2023). "The color of money at the financial frontier". *Review of international political economy : RIPE*, Vol. 30, no. 3, pp. 1073-97.
- Alavi, H. and Håbek, P. (2016). "Addressing Research Design Problem in Mixed Methods Research". *Management systems in production engineering*, Vol. 21, no. 1, pp. 62-66.
- Ameli, N., Drummond, P., Bisaro, A., Grubb, M. and Chenet, H. (2020). "Climate finance and disclosure for institutional investors: why transparency is not enough". *Climatic change*, Vol. 160, no. 4, pp. 565-89.
- Baker, L. (2023). "New frontiers of electricity capital: energy access in sub-Saharan Africa". *New political economy*, Vol. 28, no. 2, pp. 206-22.
- Baker, S. and Edwards, R. (2012). How many qualitative interviews is enough? Expert voices and early career reflections on sampling and cases in qualitative research. National Centre for Research Methods Review Paper.
- Baumli, K. and Jamasb, T. (2020). Assessing Private Investment in African Renewable Energy Infrastructure: A Multi-Criteria Decision Analysis Approach.
- Bellucci, M., Simoni, L., Acuti, D. and Manetti, G. (2019). "Stakeholder engagement and dialogic accounting". *Accounting, auditing, & accountability*, Vol. 32, no. 5, pp. 1467-99.
- Bernards, N. (2024). "Where is finance in the financialization of development?". *Globalizations*, Vol. 21, no. 1, pp. 88-102.
- Berryman, D.R. (2019). "Ontology, Epistemology, Methodology, and Methods: Information for Librarian Researchers". *Medical reference services quarterly*, Vol. 38, no. 3, pp. 271-79.
- Bhatia, M. and Angelou, N. (2015). Beyond Connection-Energy Access Redefined, Technical report, ESMAP.
- Biesta, G. (2010). Pragmatism and the philosophical foundations of mixed methods research1. In A. Tashakkori, C. Teddlie (Eds.) Pragmatism and the philosophical foundations of mixed methods research1. 2nd ed. SAGE Publications, Inc.

- Biesta, G. (2012). 'Mixed Methods' in J. Arthur, M. Waring, R. Coe and L. Hedges (eds), *Research Methods and Methodologies in Education*. Thousand Oaks, CA: Sage.
- Birks, M. and Mills, J. (2015). *Grounded theory: A practical guide*. Sage.
- Bonizzi, B. (2013). "Financialization in Developing and Emerging Countries: A Survey". *International journal of political economy*, Vol. 42, no. 4, pp. 83-107.
- Bonizzi, B., Kaltenbrunner, A. and Powell, J. (2022). "Financialised capitalism and the subordination of emerging capitalist economies". *Cambridge journal of economics*, Vol. 46, no. 4, pp. 651-78.
- Bougrea, A. (2024). "The European Investment Bank in Sub-Saharan Africa: constrained expansion". *Journal of economic policy reform*, pp. 1-25.
- Bracking, S. (2016). "The financialisation of power : how financiers rule Africa".
- Bracking, S. and Leffel, B. (2021). "Climate finance governance: Fit for purpose?". *Wiley interdisciplinary reviews. Climate change*, Vol. 12, no. 4, pp. e709-n/a.
- Bridge, G., Bouzarovski, S., Bradshaw, M. and Eyre, N. (2013). "Geographies of energy transition: Space, place and the low-carbon economy". *Energy policy*, Vol. 53, pp. 331-40.
- Bridge, G., Bulkeley, H., Langley, P. and van Veelen, B. (2020). "Pluralizing and problematizing carbon finance". *Progress in Human Geography*, Vol. 44, no. 4, pp. 724-42.
- Brotzge, L., Wyss, D., Fabozzi, F.J., Armitage, S. and Torre, A.d.l. (2011). "Financing and raising capital".
- Burton, D. (2020). "Digital Debt Collection and Ecologies of Consumer Overindebtedness". *Economic geography*, Vol. 96, no. 3, pp. 244-65.
- Castán Broto, V. and Kirshner, J. (2020). "Energy access is needed to maintain health during pandemics". *Nature energy*, Vol. 5, no. 6, pp. 419-21.
- Castree, N. (2008). "Neoliberalising Nature: The Logics of Deregulation and Reregulation". *Environment and planning. A*, Vol. 40, no. 1, pp. 131-52.
- CCAK and MOEP (2019). *Kenya Cooking Sector Study: Assessment of the Supply and Demand of Cooking Solutions at the Household level*.
- Christopherson, S., Martin, R. and Pollard, J. (2013). "Financialisation: Roots and repercussions". *Cambridge journal of regions, economy and society*, Vol. 6, no. 3, pp. 351-57.

- Cingolani, M. and Toporowski, J. (2024). "A proper financialisation? New financing mechanisms for developing countries". *Cambridge journal of economics*, Vol. 48, no. 3, pp. 513-24.
- Ciplet, D., Falzon, D., Uri, I., Robinson, S.-a., Weikmans, R. and Roberts, J.T. (2022). "The unequal geographies of climate finance: Climate injustice and dependency in the world system". *Political geography*, Vol. 99, p. 102769.
- Claringbould, D., Koch, M. and Owen, P. (2019). "Sustainable finance: the European Union's approach to increasing sustainable investments and growth – opportunities and challenges". *Vierteljahrshefte zur Wirtschaftsforschung*, Vol. 88, no. 2, pp. 11-27.
- Climate Policy Initiative (2022). Landscape of Climate Finance in Africa.
- Climate Policy Initiative (2024). Landscape of Climate Finance in Africa 2024.
- Coppock, S. (2013). "The everyday geographies of financialisation: Impacts, subjects and alternatives". *Cambridge journal of regions, economy and society*, Vol. 6, no. 3, pp. 479-500.
- CPI (2024). Landscape of Climate Finance in Africa 2024. <https://www.climatepolicyinitiative>.
- Creswell, J.W. (2015). *A Concise Introduction to Mixed Methods Research*. Thousand Oaks, CA: Sage.
- Creswell, J.W. and Plano Clark, V.L. (2011). "Designing and conducting mixed methods research".
- David, H. (2017). Strathmore eyes Kenya Power earnings.
- Dimmelmeier, A. (2024). "Expanding the politics of measurement in sustainable finance: Reconceptualizing environmental, social and governance information as infrastructure". *Environment and planning. C, Politics and space*, Vol. 42, no. 5, pp. 761-81.
- Dubey, S., Adovor, E., Rysankova, D. and Koo, B. (2020). "Kenya - Beyond Connections : Energy Access Diagnostic Report Based on the Multi-Tier Framework".
- Dymski, G. (2018). "Finance and Financial Systems: Evolving Geographies of Crisis and Instability".
- Eberhard, A., Gratwick, K. and Kariuki, L. (2018). "Kenya's lessons from two decades of experience with independent power producers". *Utilities policy*, Vol. 52, pp. 37-49.
- Epstein, G. (2005). "Financialization and the world economy".
- ESMAP (2015). National Workshop Targets Kenya's Electrification Challenges.
- Falchetta, G., Michoud, B., Hafner, M. and Rother, M. (2022). "Harnessing finance for a new era of decentralised electricity access: A review of private investment patterns and

emerging business models". *Energy research & social science*.

- Falduto, C., Noels, o. and Jachnik, R. (2024). The New Collective Quantified Goal on climate finance. Options for reflecting the role of different sources, actors and qualitative considerations.
- Fayulu, M. (2022). Asymmetric network ties to elite American universities create differential access to venture capital in Africa. Massachusetts Institute of Technology.
- Fields, N., Ryves, D., Yeganyan, R., Cannone, C., Tan, N. and Howells, M. (2023). "Evidence-Based Policymaking: Insights and Recommendations for the Implementation of Clean Energy Transition Pathways for Kenya's Power Sector". *Energies (Basel)*, Vol. 16, no. 23, p. 7904.
- Flourish Ventures (2024). Passion and Perseverance: Voices from the African Founder Journey.
- Founder Africa (2023). The Journey Of M-Kopa: Empowering Lives through Innovation and Growth.
- French, S., Leyshon, A. and Wainwright, T. (2011). "Financializing space, spacing financialization". *Progress in Human Geography*, Vol. 35, no. 6, pp. 798-819.
- Froud, J., Haslam, C., Johal, S. and Williams, K. (2000). "Shareholder value and Financialization: consultancy promises, management moves". *Economy and society*, Vol. 29, no. 1, pp. 80-110.
- Gabor, D. (2021). "The Wall Street Consensus". *Development and change*, Vol. 52, no. 3, pp. 429-59.
- Geels, F.W. (2002). "Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case-study". *Research policy*, Vol. 31, no. 8, pp. 1257-74.
- Godinho, C. and Eberhard, A. (2019). Learning from Power Sector Reform. The Case of Kenya.
- GOGLA (2021). A big win for Kenya: Government reinstates VAT exemption on renewable energy products.
- GOGLA (2022). Investments in the off-grid solar sector grow by 44 to hit a record 450m in 2021.
- Goulding, C. (2002). "Grounded theory : a practical guide for management, business and market researchers".
- Grafe, F.-J. and Mieg, H.A. (2019). "Connecting financialization and urbanization: the changing financial ecology of urban infrastructure in the UK". *Regional studies, regional science*, Vol. 6, no. 1, pp. 496-511.

- Green, W.N. (2024). "Agrarian financial ecologies: Centring land and labour in geographies of debt". *Transactions - Institute of British Geographers (1965)*, Vol. 49, no. 3, p. n/a.
- Greene, J.C. (2006). "Toward a Methodology of Mixed Methods Social Inquiry". *Research in the schools*, Vol. 13, no. 1, p. 93.
- Greene, J.C. (2007). "Mixed methods in social inquiry".
- Greene, J.C. and Caracelli, V.J. (1997). Defining and describing the paradigm issue in mixed-method evaluation. *New Directions for Evaluation*.
- Greene, J.C., Caracelli, V.J. and Graham, W.F. (1989). "Toward a Conceptual Framework for Mixed-Method Evaluation Designs". *Educational evaluation and policy analysis*, Vol. 11, no. 3, pp. 255-74.
- Guest, G., Bunce, A. and Johnson, L. (2006). "How Many Interviews Are Enough?: An Experiment with Data Saturation and Variability". *Field methods*, Vol. 18, no. 1, pp. 59-82.
- Hammond, M. and Wellington, J.J. (2013). "Research methods : the key concepts".
- Hennink, M.M., Hutter, I. and Bailey, A. (2011). "Qualitative research methods".
- Hiss, S. (2013). "The Politics of the Financialization of Sustainability". *Competition & change*, Vol. 17, no. 3, pp. 234-47.
- Hudson, D. (2008). "Developing geographies of financialisation: banking the poor and remittance securitisation". *Contemporary politics*, Vol. 14, no. 3, pp. 315-33.
- Igiebor, G.O. and Okonmah, E. (2022). The application and implication of combining quantitative and qualitative data in the social sciences: a third methodological movement in context. *Wilberforce Journal of the Social Sciences*.
- Jaoui, F., O. Amoussou and H.F., K. (2022). 'Catch Me if You Can': On Drivers of Venture Capital
- Investment in Africa, Working Paper Series N° 364, African Development Bank, Abidjan, Côte d'Ivoire.
- Jilltoft, W. and Westman, E. (2017). Thesis: Early Stage Venture Capital in Emerging Markets- Casestudy Kenya.
- Johnson, R.B. and Onwuegbuzie, A.J. (2004). "Mixed Methods Research: A Research Paradigm Whose Time Has Come". *Educational researcher*, Vol. 33, no. 7, pp. 14-26.
- Johnson, R.B., Onwuegbuzie, A.J. and Turner, L.A. (2007). "Toward a Definition of Mixed Methods Research". *Journal of mixed methods research*, Vol. 1, no. 2, pp. 112-33.

- Jones, A. and Murphy, J.T. (2011). "Theorizing practice in economic geography: Foundations, challenges, and possibilities". *Progress in Human Geography*, Vol. 35, no. 3, pp. 366-92.
- Karwowski, E. (2021). Commercial finance for development: a back door for financialisation. *Review of African Political Economy*.
- Kaur, A. and Lodhia, S. (2018). "Stakeholder engagement in sustainability accounting and reporting". *Accounting, Auditing & Accountability Journal*, Vol. 31, no. 1, pp. 338-68.
- KenGen (2023). Integrated Annual Report & Financial Statements For the Year Ended 30 June 2023.
- Kenya National Bureau of Statistics (2023). Economic Survey, Facts & Figures 2023.
- Khusoko (2020). Kenya's Safaricom 20 year Journey.
- Klagge, B. and Nweke-Eze, C. (2020). "Financing large-scale renewable-energy projects in Kenya: investor types, international connections, and financialization". *Geografiska Annaler, Series B: Human Geography*, Vol. 102, no. 1, pp. 61-83.
- KNBS (2009). The 2009 Kenya Population and Housing Census.
- KNBS (2019). 2019 Kenya Population and Housing Census: Volume IV.
- KPLC (2017). Annual Report and Financial Statements for the Year Ended 30th June 2017.
- KPLC (2019). Annual Report and Financial Statements for the Year Ended 30th June 2019.
- KPLC. (2023). *Annual Report and Financial Statements for the Year Ended 30th June 2023*.
- Krippner, G.R. (2005). The financialization of the American economy. *Socio-economic review*, .
- Kumar, A., Butcher, S., Hammett, D., Barragan-Contreras, S., Burns, V., Chesworth, O. et al. (2024). "Development beyond 2030: more collaboration, less competition?". *International development planning review*, Vol. 46, no. 2, pp. 227-42.
- Kumar, A., Höffken, J. and Pols, A. (2021). "Dilemmas of energy transitions in the global south : balancing urgency and justice".
- Lai, K.P.Y. (2025). "Financial geography II - green finance and climate transition". *Progress in Human Geography*.
- Lapavitsas, C. (2009). "FINANCIALISATION EMBROILS DEVELOPING COUNTRIES". *Papeles de Europa*, Vol. 19, pp. 108-39.
- Lapavitsas, C. and Soydan, A. (2022). "Financialisation in developing countries: approaches, concepts, and metrics". *International review of applied economics*, Vol. 36, no. 3, pp. 424-

47.

- Leach, G. (1992). "The energy transition". *Energy policy*, Vol. 20, no. 2, pp. 116-23.
- Leyshon, A., Burton, D., Knights, D., Alferoff, C. and Signoretta, P. (2004). "Towards an ecology of retail financial services: Understanding the persistence of door-to-door credit and insurance providers". *Environment and planning. A*, Vol. 36, no. 4, pp. 625-45.
- Lima, R. (2022). *Subordinate Financialization Through Housing: Institutional Investors and Urban Development in Lisbon* Doctor of Philosophy, University of Sheffield.
- Magale, E.G. (2021). "Developing a green bond market in Kenya: perspectives from practitioners and lessons from developing markets". *Journal of sustainable finance & investment*, Vol. ahead-of-print, no. ahead-of-print, pp. 1-18.
- Matthews, B. and Ross, L. (2010). "Research methods : a practical guide for the social sciences".
- Mawdsley, E. (2018). "Development geography II: Financialization". *Progress in Human Geography*, Vol. 42, no. 2, pp. 264-74.
- Mazzoli, M. (2005). "Duménil, G., and Lévy D.: Capital Resurgent: Roots of the Neoliberal Revolution". *Journal of economics (Vienna, Austria)*, Vol. 85, no. 3, pp. 300-06.
- Michoud, B. and Hafner, M. (2021). "Financing clean energy access in sub-Saharan Africa : risk mitigation strategies and innovative financing structures".
- Ministry of Energy (2004). The Sessional Paper No.4 of 2004 on Energy.
- Ministry of Energy and Petroleum, M. (2024). Kenya National Cooking Transition Strategy. Government of Kenya.
- Ministry of Environment and Forestry (2020). Kenya's Updated Nationally Determined Contribution(NDC).
- Ministry of Environment and Natural Resources (2015). Kenya's Intended Nationally Determined Contribution (INDC).
- Mkalama, B. and Ouma, S. (2024). To whom does the money go? Mapping the uneven financial geographies of venture capital in 'Silicon Savannah', Kenya.
- MOEP (2016). Sustainable Energy for All Kenya Investment Prospectus.
- MOEP (2018). Kenya National Electrification strategy (KNES).
- MOEP (2020). Policy framework on branding of energy flagship projects.
- MOEP (2023). Kenya Energy Transition and Investment Plan.

- MOEP (2024). Kenya National Cooking Transition Strategy. Government of Kenya.
- Moner-Girona, M., Bódis, K., Morrissey, J., Kougias, I., Hankins, M., Huld, T. et al. (2019). "Decentralized rural electrification in Kenya: Speeding up universal energy access". *Energy for sustainable development*, Vol. 52, pp. 128-46.
- Mwawughanga, F. (2005). Regulatory Framework for Geothermal in Kenya.
- Nardi, B. and O'Day, V.L. (1999). Information ecologies.
- Neubauer, B.E., Witkop, C.T. and Varpio, L. (2019). "How phenomenology can help us learn from the experiences of others". *Perspectives on medical education*, Vol. 8, no. 2, pp. 90-97.
- Newell, P. and Phillips, J. (2016). "Neoliberal energy transitions in the South: Kenyan experiences". *Geoforum*, Vol. 74, pp. 39-48.
- O'Hanlon, F. (2018). Mixed methods research: Achieving a robust design. in J Ravenscroft & L Hamilton (eds), *Building Your Research Design in Education: Theoretically Informed Advanced Methods*. 1st ed. Bloomsbury.
- Ogunsola, O., Adebayo, Y., Dienagha, I., Ninduwezuor-Ehiobu, N. and Nwokediegwu, Z. (2024). Public-private partnership models for financing renewable energy and infrastructure development in sub-saharan africa. *GJABR*, .
- Osano, H.M. and Koine, P.W. (2016). "Role of foreign direct investment on technology transfer and economic growth in Kenya: A case of the energy sector". *Journal of innovation and entrepreneurship*, Vol. 5, no. 31, pp. 1-25.
- Park, J. (2021). Theorizing and learning from Kenya's evolving solar energy enterprise development. *Energy Research and Social Science*.
- Perry, K.K. (2021). "The new 'bond-age', climate crisis and the case for climate reparations: Unpicking old/new colonialities of finance for development within the SDGs". *Geoforum*, Vol. 126, pp. 361-71.
- Pfende, R. (2025). *Securitization for Social Impact: Why It's the Ideal Instrument for Scaling Social Enterprises Providing Consumer Financing in the Developing World*.
- Polanyi, K. (2001). "The great transformation : the political and economic origins of our time".
- Powell, J. (2013). "Subordinate Financialization: A Study of Mexico and Its NonFinancial Corporations." PhD dissertation. SOAS, University of London.
- Pyka, I. and Noco, A. (2021). "Banks' Capital Requirements in Terms of Implementation of the Concept of Sustainable Finance". *Sustainability*.

- Robin, E. (2022). "Rethinking the geographies of finance for urban climate action". *Transactions - Institute of British Geographers (1965)*, Vol. 47, no. 2, pp. 393-408.
- Saitet, D. and Muchemi, G. (2015). Kengen Financing Mechanisms for Geothermal Projects in Kenya.
- Sawyer, M. (2013). "What Is Financialization?". *International journal of political economy*, Vol. 42, no. 4, pp. 5-18.
- Schaltegger, S., Etzeberria, I.Á. and Ortas, E. (2017). "Innovating Corporate Accounting and Reporting for Sustainability – Attributes and Challenges". *Sustainable development (Bradford, West Yorkshire, England)*, Vol. 25, no. 2, pp. 113-22.
- SE4ALL (2013). Beyond Connections:Energy Access Redefined. Introducing multi-tier approach to measuring energy access.
- SE4ALL (2024). Our journey towards Sustainable Energy for All.
- SE4All, S.E.f.A. and MOEP, M.o.E.a.P. (2016). Kenya Investment Prospectus. Pathways for concerted action towards sustainable energy for all by 2030.
- Silverman, D. (2006). Interpreting qualitative data. . 3rd ed. London: Sage.
- Simo, C. and Ndifor, C. (2025). A review of sustainable finance literature in sub-saharan africa. *International Journal of Scientific and Management Research*, 08(01), 121-136. .
- Smith, J.K. and Heshusius, L. (1986). "Closing down the Conversation: The End of the Quantitative-Qualitative Debate among Educational Inquirers". *Educational researcher*, Vol. 15, no. 1, pp. 4-12.
- Sokona, Y., Mulugetta, Y. and Gujba, H. (2012). "Widening energy access in Africa: Towards energy transition". *Energy policy*, Vol. 47, no. 1, pp. 3-10.
- SolarAid (2014). Kenya celebrates VAT exemption for solar.
- Soloviov, N. (2023). Financing of the energy transition in developing countries. *Business, Management and Economics*.
- Steffen, B. and Schmidt, T.S. (2019). "A quantitative analysis of 10 multilateral development banks' investment in conventional and renewable power-generation technologies from 2006 to 2015". *Nature energy*, Vol. 4, no. 1, pp. 75-82.
- Sun, H., He, S., Cheng, N. and Liu, Z. (2024). "Climate transition risk and enterprise default probability". *Business strategy and the environment*, Vol. 33, no. 8, pp. 8929-45.
- Taggart, J. and Power, M. (2024). "Rendering development investible: The anti-politics machine and the financialisation of development". *Progress in Human Geography*, Vol.

48, no. 5, pp. 552-74.

Taghizadeh-Hesary, F., Zakari, A., Alvarado, R. and Tawiah, V. (2022). "The green bond market and its use for energy efficiency finance in Africa". *China finance review international*, Vol. 12, no. 2, pp. 241-60.

Tashakkori, A. and Teddlie, C. (1998). "Mixed methodology : combining qualitative and quantitative approaches".

Teddlie and Tashakkori, A. (2010). Overview of Contemporary Issues in Mixed Methods Research in A.Tashakkori & C.Teddlie (eds) SAGE Handbook of Mixed Methods in Social and Behavioural Research. 2nd ed. Thousand Oaks, CA: Sage.

Teddlie, C. and Tashakkori, A. (2009). "Foundations of mixed methods research : integrating quantitative and qualitative approaches in the social and behavioral sciences".

Teddlie, C. and Tashakkori, A. (2012). "Common "Core" Characteristics of Mixed Methods Research: A Review of Critical Issues and Call for Greater Convergence". *The American behavioral scientist (Beverly Hills)*, Vol. 56, no. 6, pp. 774-88.

The National Treasury (2016). National climate finance policy (NCFP).

The National Treasury, Climate Policy Initiative and The Kenya Climate Innovation Centre (2021). The Landscape of Climate Finance in Kenya. On the road to implementing Kenya's NDC.

The National Treasury and Planning. (2021). *The Landscape of Climate Finance in Kenya. On the road to implementing Kenya's NDC*.

The National Treasury and Planning (2023). Annual Public Debt Management Report For Financial Year 2022/2023.

The World Bank (2019). Maximizing Financing for Development in Action: The Kenya Energy Sector Experience.

The World Bank Group, t.A.D.B.A., Asian Development Bank (AsDB), European Bank for Reconstruction and Development (EBRD), European Investment Bank (EIB), the Inter-American Development Bank Group (IDBG) and the International Monetary Fund (IMF) (2015). From Billions to Trillions: MDB Contributions to Financing for Development.

Turkelli, G.E. (2022). "Multistakeholder Partnerships for Development and the Financialization of Development Assistance". *Development and change*, Vol. 53, no. 1, pp. 84-116.

Turner-Bowker, D.M., Lamoureux, R.E., Stokes, J., Litcher-Kelly, L., Galipeau, N., Yaworsky, A. et al. (2018). "Informing a priori Sample Size Estimation in Qualitative Concept

Elicitation Interview Studies for Clinical Outcome Assessment Instrument Development". *Value in health*, Vol. 21, no. 7, pp. 839-42.

UNDP (2019). Promoting energy efficiency as a climate change mitigation action in Kenya.

United Nations (2015). Paris Agreement.

van der Zwan, N. (2014). "Making sense of financialization". *Socio-economic review*, Vol. 12, no. 1, pp. 99-129.

Wahyuni, W., Sumarni, S., Fadilah, N. and Nurhalizah, N. (2024). Integrating sustainability into accounting practices: a review of social and environmental accounting. *AAAR*, 2(3)

Weijnen, M.P.C., Lukszo, Z. and Farahani, S. (2021). "Shaping an inclusive energy transition".

Wengraf, T. (2001). "Qualitative research interviewing : biographic narrative and semi-structured methods".

WHO (2023). Household Air Pollution.

Widjanarko, A. (2024). "Political-Economic Comparison of The World Bank and The New Development Bank". *JJET (Jurnal Ilmu Ekonomi Terapan)*.

Woolley, C.M. (2009). "Meeting the Mixed Methods Challenge of Integration in a Sociological Study of Structure and Agency". *Journal of mixed methods research*, Vol. 3, no. 1, pp. 7-25.

World Bank Group (2020). Doing Business 2020. Region Profile, Sub-Saharan Africa.

Yang, K. (2010). "Making sense of statistical methods in social research [electronic resource]".

Yilmaz, K. (2013). "Comparison of Quantitative and Qualitative Research Traditions: epistemological, theoretical, and methodological differences". *European journal of education*, Vol. 48, no. 2, pp. 311-25.