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2025
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Exploratory Study of Innovative Financing Mechanisms for Renewable Energy Projects in South Africa.

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Under the Supervision of

Dr Tsele Moloi

Research proposal presented to the Faculty of Commerce, Law and Management, University of the Witwatersrand, to partially meet the requirements for the Masters of Business Administration (MBA) degree

Johannesburg, 2025

Abstract

This exploratory study investigates the implementation and impact of innovative financing mechanisms for renewable energy projects in South Africa, a country at the crossroads of urgent climate action and energy reform. The research aims to bridge the gap between traditional financing models and capital demands of a just energy transition by examining alternative funding solutions such as green bonds, public-private partnerships (PPPs), blended finance, and Just Energy Transition Partnerships (JETPs). Grounded in a qualitative interpretivist paradigm, the study employs document analysis as its core methodology, analysing over 20 sources ranging from policy documents and academic literature to market reports and international agency publications.

The findings reveal that South Africa possesses a relatively mature financial ecosystem compared to other African nations, with institutions like the Development Bank of Southern Africa (DBSA) and Public Investment Corporation (PIC) playing key roles in mobilising private and concessional capital. Despite this, the nation still encounters considerable obstacles, including regulatory uncertainty, soaring capital costs, and limited access to affordable, risk-adjusted financing, especially for smaller, community driven or early-stage renewable projects. Comparative insights from India, Kenya and Nigeria underscore the importance of policy consistency, investor confidence, and tailored financial instruments in unlocking sustainable energy investments.

The thematic analysis shows that innovative financing tools have proven effective in selective cases, with South Africa's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) emerging as a model PPP framework that attracted billions in private investment. Similarly, the country's intention to launch sovereign green bonds and expand blended finance initiatives signals promising pathways. Yet, gaps remain in grid infrastructure investment, local currency financing, and community-based equity participation. The study presents a conceptual framework linking policy reform, institutional capacity, financial innovation, and investment flows, highlighting feedback lops that can either catalyse or constrain renewable energy deployment.

In conclusion, the research underscores the critical need for a coordinated and inclusive financing strategy that aligns domestic and international resources, fosters regulatory stability, and embeds equity considerations into South Africa's clean energy transition. Strategic recommendations include finalising the sovereign green bond framework, accelerating transmission infrastructure upgrades, scaling blended finance platforms, and establishing community ownership models. If implemented effectively, these measures can transform South Africa into a reginal leader in sustainable energy financing and offer replicable lessons for other developing economies aiming to meet their climate and development goals.

Key Words: Renewable Energy Projects, Financing Barriers, Institutional Capacity, South Africa.

Declaration

I, ___Kesaven Moodley___, do hereby state that, with the exception of what is mentioned in the acknowledgements and references, this research paper is my own work. It is presented to the University of the Witwatersrand in Johannesburg to partially fulfil the criteria for the Masters of Business Administration degree. It has never been previously submitted to any other institution in lieu of a degree or assessment.

Name: Kesaven Moodley

Signed at _____Johannesburg_____On the_____30th day of June 2025____

Signature:

Dedication

I commit this work to my nieces, nephew, and colleagues in the hope that it would encourage them to always believe in their boundless potential and to strive for greatness.

Acknowledgments

“Research is to see what everybody else has seen and to think what nobody else has thought” — **Albert Szent-Györgyi**

I would want to express my sincere gratitude to everyone who helped make this research a success. First and foremost, I am profoundly thankful to my academic supervisor Dr Tsele Moloi for his insightful guidance, critical feedback, and unwavering support throughout the research process. His expertise in renewable energy finance and qualitative research has been instrumental in shaping the depth and direction of this study.

I am also indebted to the numerous scholars, institutions, and organisations whose work I have referenced and analysed. The wealth of publicly available literature, policy documents, and financial reports was invaluable in conducting a thorough and informed document analysis. Special recognition goes to international bodies such as IRENA, the IEA, UNDP, and the World Bank, whose thought leadership continues to advance the global energy transition dialogue.

To my peers and colleagues, thank you for the stimulating conversations, your encouragement, and for challenging my perspectives at critical junctures. Your support enriched this journey both intellectually and personally.

Lastly, I acknowledge my family and close friends for their enduring patience and moral support. Your belief in my abilities gave me the strength to persist through the most demanding phases of this research.

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List of Acronyms

Acronym	Full Term / Description
RE	Renewable Energy
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
IPP	Independent Power Producer
PPP	Public-Private Partnership
JETP	Just Energy Transition Partnership
DFI	Development Finance Institution
PPA	Power Purchase Agreement
SMME	Small, Medium and Micro Enterprise
IRP	Integrated Resource Plan
ITP	Independent Transmission Project
REIT	Real Estate Investment Trust
PIC	Public Investment Corporation
IDC	Industrial Development Corporation
DBSA	Development Bank of Southern Africa
PRG	Partial Risk Guarantee
FX	Foreign Exchange
MFI	Microfinance Institution
TA	Technical Assistance
CBO	Community-Based Organisation
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UN DESA	United Nations Department of Economic and Social Affairs
IRENA	International Renewable Energy Agency
IEA	International Energy Agency

IPCC	Intergovernmental Panel on Climate Change
IFC	International Finance Corporation
GCF	Green Climate Fund
CIF	Climate Investment Funds
GIIN	Global Impact Investing Network
ESG	Environmental, Social, and Governance
SARB	South African Reserve Bank
SEBI	Securities and Exchange Board of India
APRI	Africa Policy Research Institute

Chapter 1: Introduction

1.1 Statement of Purpose

The primary purpose of this study is to explore innovative financing mechanisms for renewable energy with an initial emphasis on South Africa's financing context and then situating it alongside other developing country experiences (notably India, Kenya, and Nigeria). However, this is not a comparative study.

1.2 Background of the Study

Renewable energy technologies have evolved as viable alternatives to fossil fuels, providing long-term solutions for meeting rising energy demand while mitigating the effects of climate change (IPCC, 2018). Developing countries, defined by fast population increase, urbanization, and industrialization, have considerable energy issues (IEA, 2019). These countries frequently rely on conventional energy sources, resulting in environmental damage and energy insecurity. However, abundant renewable energy resources such as solar, wind, hydro, and biomass offer potential for sustainable development (UNDP, 2020).

South Africa, as a leading economy in sub-Saharan Africa, has made notable strides in renewable energy adoption but continues to face substantial challenges in financing and policy implementation. The country's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) has been lauded for attracting private investment and stimulating the renewable energy sector. Nonetheless, issues such as policy uncertainty, grid connectivity, and financial constraints persist (Eberhard & Naude, 2016).

1.3 Problem Statement

Despite its potential, renewable energy adoptions in developing countries are hampered by several obstacles, including inadequate access to finance (IRENA, 2020). Traditional finance techniques may not be appropriate for renewable energy projects in these circumstances, due to the high perceived risks, a lack of collateral, and regulatory uncertainties.

As a result, many renewable energy projects struggle to obtain appropriate financing due the gap between traditional financing and the limited knowledge in the field of innovative financing mechanisms in South Africa.

1.4 Research Gaps

Although several studies have analysed renewable energy financing in South Africa, most focus predominantly on quantitative and policy-oriented dimensions, emphasizing cost assessments, investment flows, and policy efficiency (Eberhard & Naude, 2016; IRENA, 2020; World Bank, 2021). However, limited qualitative research explores the institutional, behavioural, and systemic dynamics that shape the performance of innovative financing instruments such as green bonds, blended finance, and public–private partnerships. Existing evaluations of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) tend to prioritize financial outcomes over the institutional processes that influence investor confidence and project sustainability (Baker, 2020; Tait et al., 2022). As a result, there remains a significant gap in understanding how financial innovation, institutional strength, and policy coherence jointly contribute to the scalability and resilience of renewable energy financing models in South Africa. This study seeks to address these shortcomings through a qualitative, document-based analysis of the interactions between policy frameworks, institutional arrangements, and innovative financing mechanisms to enhance the renewable energy transition in South Africa.

1.5 Research Objectives

Primary Objective:

To explore the innovative financing mechanisms for renewable energy projects in South Africa by situating it alongside other developing countries.

Secondary Objectives:

To explore the most effective and commonly used alternative finance mechanisms in renewable energy projects in South Africa by situating it alongside other developing countries.

To explore and outline finance mechanisms, gaps, and barriers for renewable energy projects in South Africa by situating it alongside other developing countries.

To explore recommendations to address and overcome the gaps and barriers of innovative financing mechanisms for renewable energy projects in South Africa?

1.6 Research Question

Primary Research Question:

How are the innovative financing mechanisms for renewable energy projects implemented in South Africa by situating it alongside other developing countries?

Secondary Research Questions:

What are the most effective and commonly used alternative financing mechanisms for renewable energy projects in South Africa by situating it alongside other developing countries?

What are the key gaps and barriers to financing renewable energy projects in South Africa by situating it alongside other developing countries?

What are the recommendations to address and overcome the gaps and barriers of innovative financing mechanisms for renewable energy projects in South Africa?

1.7 Rationale of the Study

The study aims to address the urgent challenges of energy poverty, environmental degradation, and climate change in developing markets (World Bank, 2019). This study intends to promote sustainable energy transitions, economic development, and poverty alleviation by investigating innovative funding structures specific to these circumstances.

1.8 Delimitations of the Study

The study was geographically focused on developing nations, including Africa, Asia, and Latin America. Temporally, it covered the period between 2018 and 2024 to ensure relevance and data accuracy. Sectorally, the research concentrated on renewable energy projects, excluding energy storage and efficiency initiatives. This scope ensured a coherent analysis of comparable markets and consistent evaluation of financing mechanisms within the chosen timeframe.

1.9 Assumptions

This study operates under several key assumptions that shape its design, analysis, and interpretation. It is assumed that the secondary data and literature sources utilized provide an accurate and reliable representation of the current state of renewable energy financing in South Africa and comparable developing markets. Given the reliance on document analysis, it is further assumed that the selected reports, policy documents, and institutional publications are credible, up to date, and reflective of the true challenges and opportunities within the sector. The research also assumes that innovative financing mechanisms such as green bonds, blended finance, and public–private partnerships can be effectively adapted from international best practices to the South African context, notwithstanding unique structural and regulatory conditions.

Additionally, the study assumes a certain level of policy consistency and institutional support from government stakeholders to ensure the sustainability and scalability of financing models. It is presumed that stakeholders, including private investors, development finance institutions (DFIs), and regulatory agencies, act rationally within economic and policy frameworks, responding predictably to financial incentives and risk-reduction instruments. Finally, it is assumed that the outcomes of this study will remain relevant over the medium term (2018–2024), given the pace of South Africa's energy transition and its alignment with broader regional and global sustainability goals.

Chapter 2: Literature Review

2.1 Introduction

The following literature review provides a holistic analysis of the current condition of research on renewable energy adoption and innovative financing mechanisms in developing markets. It seeks to provide a thorough understanding of the current state of knowledge, identify key trends, gaps, and challenges, and establish the theoretical and conceptual foundations for the proposed research. Additionally, this literature review contributes towards the advancement of scholarly discourse and informs evidence-based decision-making in the field of renewable energy finance through an extensive review of empirical studies, theoretical frameworks, and conceptual models.

2.2 Empirical Literature Review

The adoption of renewable energy in developing markets is influenced by a complex interaction of political, technological, and socioeconomic variables. Although the deployment of renewable energy sources in emerging markets face many obstacles and challenges, they have great potential for addressing issues related to energy access, mitigating the effects of climate change, and supporting sustainable development.

Empirical evidence suggests that “several factors contribute to the increasing uptake of renewable energy technologies in developing markets. One significant driver is the abundance of renewable energy resources, such as solar, wind, hydro, and biomass, in many developing countries” (IRENA, 2020). Additionally, “renewable energy technologies have become increasingly cost-competitive compared to conventional energy sources, thanks to technological advancements, economies of scale, and declining costs of components” (IEA, 2019).

“Despite the numerous drivers of renewable energy adoption, significant barriers and challenges hinder the widespread deployment of renewable energy technologies in developing markets. One of the primary barriers is the lack of access to finance, particularly for small-scale renewable energy projects and decentralised energy systems” (UN DESA, 2019). “Limited access to affordable capital, high borrowing costs, and perceived investment risks deter investors and developers from financing renewable energy projects in many developing countries” (IRENA, 2020).

“Policy and regulatory barriers also impede renewable energy deployment in developing markets. Inconsistent or inadequate regulatory frameworks, bureaucratic procedures, and administrative hurdles create uncertainties for investors and developers” (Brazilian et al., 2018). Additionally, “policy instability and changes in government priorities can undermine investor confidence and hinder long-term planning for renewable energy projects” (IEA, 2019).

Innovative financing mechanisms play a crucial role in removing financial barriers and attracting investment for energy projects in developing markets. The following are a few of the many finance models, tools, and strategies used to support the deployment of renewable energy in a resource-constrained context.

2.2.1 Green Bonds have emerged as a popular financing instrument for funding renewable energy projects and other environmentally sustainable initiatives (World Bank, 2021). The green bond market has experienced significant growth in recent years, driven by investor demand for socially responsible investments and regulatory incentives promoting green finance” (Batten et al., 2020). “Developing countries have increasingly tapped into green bond markets to finance renewable energy projects and climate mitigation initiatives, leveraging international capital markets to meet their sustainable development objectives (World Bank, 2021).

Green bonds have also gained traction as a means of financing renewable energy infrastructure. These financial instruments raise capital for sustainable projects by tapping into fixed income markets and attracting institutional investors seeking environmentally responsible investments (Climpson et al., 2018). The climate bonds initiative reports a significant increase in green bond issuance, particularly in emerging markets, reflecting growing interest in climate-friendly investments (Climate Bonds Initiative, 2021).

However, challenges such as market liquidity, standardisation of green bond frameworks, and verification of environmental impact remain important considerations for issuers and investors (Batten et al., 2020).

2.2.2 Crowd Funding platforms have emerged as a promising avenue for financing renewable energy projects, enabling small-scale investors to contribute funds to specific initiatives (Breitinger et al., 2020). Communities can drive their own

investments through platforms like Kiva and Lendahand, which encourage local ownership and engagement in energy initiatives.

2.2.3 Climate Finance Instruments including climate funds, carbon finance mechanisms, and climate-focused development assistance, provide financial support for renewable energy projects and climate mitigation initiatives in developing countries (World Bank, 2021). Climate funds, such as the Green Climate Fund (GCF) and Climate Investment Funds (CIF's), mobilize public and private sector resources to finance climate-resilient infrastructure, renewable energy deployment, and sustainable land use practices (GCF, 2021). These funds support a wide range of projects, including renewable energy generation, energy efficiency improvements, and climate adaption measures, to address the dual challenges of climate change and sustainable development (CIF's, 2021).

2.2.4 Carbon Finance Mechanisms such as carbon markets, carbon offset schemes, and carbon pricing initiatives, provide financial incentives for reducing greenhouse gas emissions and promoting clean energy investments (World Bank, 2021). Through carbon pricing mechanisms, governments and regulatory authorities impose a price on carbon emissions, creating economic incentives for industries to transition to low-carbon technologies and practices (World Bank, 2021).

Carbon offset schemes allow renewable energy developers to monetize carbon credits generated from clean energy projects, providing an additional revenue stream and facilitating project finance (IFC, 2020).

2.2.5 Microfinance Institutions (MFIs) and Community Investment Funds play a vital role in promoting renewable energy access at grassroots level. Microfinance initiatives provide small loans and financial services to individuals and communities, enabling them to invest in renewable energy technologies (IFC, 2019). By leveraging existing microfinance networks and community-based organisations, these initiatives facilitate access to affordable capital for energy projects, particularly in rural and underserved areas (ADB, 2020).

"Community investment funds, such as community-owned energy cooperatives and impact investment funds, enable local communities to collectively finance, own, and operate renewable investment funds, enable local communities to collectively finance, own, and operate renewable energy projects (IRENA, 2021).

2.2.6 Impact Investment Funds play a critical role in mobilizing private sector finance for renewable energy projects with social and environmental benefits. Impact investors seek to generate positive social and environmental impact alongside financial returns (GIIN, 2021).

2.2.7 Philanthropic Capital including grants, concessional finance, and blended finance mechanisms, complements impact investments by providing early-stage funding, technical assistance, and risk mitigation support for renewable energy projects (UNDP, 2020). Philanthropic organisations, bilateral donors, and multilateral agencies allocate resources to renewable energy initiatives that align with their development priorities and sustainability goals, catalysing innovation, and market transformation in the clean energy sector (UNDP, 2020).

2.3 Analytical Framework

The analytical framework of this study integrates concepts from Financial Innovation Theory, Institutional Theory, and Neoclassical Economics to explain the dynamics of renewable energy financing in South Africa and other developing economies. The convergence of these theories provides a multidimensional understanding of how innovative financial instruments, institutional environments, and market forces interact to shape the flow of investment into renewable energy projects.

From **Financial Innovation Theory**, the research adopts the concept of financial adaptation to market inefficiencies and risk asymmetries. Financial innovation arises when existing mechanisms fail to address emerging financing needs or when institutional barriers prevent capital from flowing efficiently. In the context of renewable energy in developing markets, this theory highlights how innovative instruments such as green bonds, blended finance, and public–private partnerships as adaptive tools to mitigate high perceived risks and reduce financing gaps. These innovations lower transaction costs, enhance liquidity, and create new risk-sharing structures that can mobilize both private and institutional investors. This theoretical lens directly supports the first and third research objectives, which seek to identify alternative financing mechanisms and explore opportunities to enhance the effectiveness of current financial structures in South Africa.

Institutional Theory provides a complementary perspective by emphasizing the role of formal and informal institutions such as regulations, norms, and governance

structures in shaping financial behavior and investment decisions. In the renewable energy sector, institutions influence not only investor confidence but also the legitimacy and scalability of financial innovations. Institutional stability, transparency, and policy coherence are therefore critical to reducing uncertainty and transaction costs for investors. This theory aligns with the second and fourth research objectives, which assess the current status of renewable energy adoption and the challenges that constrain financing. By analysing institutional capacity, regulatory environments, and governance efficiency, the study can determine how institutional reform may improve financial intermediation and risk mitigation.

Finally, **Neoclassical Economics** provides the foundational lens for understanding how investment decisions are influenced by market signals such as interest rates, risk–return expectations, and resource allocation efficiency. The theory assumes rational investors who allocate capital toward projects that maximize returns relative to risk. However, in developing economies, externalities such as environmental benefits and social outcomes are often undervalued in traditional financial models. This creates a market failure, where socially desirable projects like renewable energy remain underfinanced. The incorporation of government incentives, subsidies, and carbon pricing mechanisms helps internalize these externalities, aligning private incentives with social objectives. The neoclassical perspective therefore supports the fifth research objective and main proposition that removing financial and institutional barriers enhances scalability and sustainability of renewable energy solutions.

Together, these theoretical concepts create a cohesive analytical framework for the study. Financial innovation explains *how* new instruments bridge financing gaps; institutional theory explains *why* regulatory and governance environments determine their effectiveness; and neoclassical economics explains *what* market mechanisms and incentives drive investment behavior. By integrating these perspectives, the framework provides a robust foundation for analyzing South Africa's renewable energy financing ecosystem and developing evidence-based recommendations that respond to the study's objectives, research questions, and propositions.

2.4 Conclusion

The literature review concludes by offering a thorough examination of the acceptance of renewable energy and innovative financing mechanisms in developing markets. The review emphasizes the motivations, obstacles, and effects of the deployment of renewable energy as well as the function of innovative financing mechanisms in removing financial barriers and attracting investment.

2.5 Research Hypotheses (Or Propositions)

Given that this study adopts a qualitative and exploratory design, it does not seek to test hypotheses in the traditional quantitative sense but rather develops propositions that guide interpretation and thematic analysis. These propositions are derived from the integrated theoretical framework combining Financial Innovation Theory**,** Institutional Theory**,** and Neoclassical Economics**,** and they address the key issues highlighted in the research objectives and questions.

Proposition 1

Innovative financing mechanisms such as green bonds, blended finance, and public–private partnerships enhance the scalability and sustainability of renewable energy projects in developing economies when they effectively mitigate investment risks and lower the cost of capital. This proposition draws from Financial Innovation Theory, which emphasizes the adaptive capacity of financial systems to address structural inefficiencies and create new channels for capital mobilization.

Proposition 2

Institutional capacity, policy coherence, and regulatory stability play a critical mediating role between the availability of innovative finance and the actual deployment of renewable energy infrastructure. Derived from Institutional Theory, this proposition suggests that strong governance frameworks, transparent procurement processes, and consistent regulatory oversight reduce transaction costs and increase investor confidence.

Proposition 3

The alignment of financial incentives with social and environmental outcomes through instruments such as feed-in tariffs, tax credits, and climate funds enhances the

attractiveness of renewable energy investment to private sector actors. Based on Neoclassical Economics, this proposition acknowledges the role of price signals, subsidies, and externality correction in shaping rational investor behavior.

Proposition 4

Blended financing structures that combine concessional and commercial capital are more effective in crowding in private investment for renewable energy projects than purely public or private models. This builds upon empirical evidence from emerging economies, showing that risk sharing mechanisms reduce perceived uncertainty and leverage limited public resources for larger-scale investment.

Proposition 5

Sustained success of innovative financing in South Africa depends on feedback loops between project outcomes and policy reform where successful renewable energy projects generate social legitimacy and political momentum for further institutional innovation. This proposition integrates all three theoretical lenses by recognizing that the effectiveness of financial innovation depends on continuous institutional adaptation and market responsiveness.

Collectively, these propositions guide the analysis of secondary data and documentary evidence, helping to identify patterns, relationships, and underlying mechanisms that influence the performance and evolution of innovative financing mechanisms in South Africa’s renewable energy sector.

Chapter 3: Research Methodology

3.1 Introduction

According to Dawson (2019), a research methodology is the primary principle that will guide the research. It becomes the general approach in conducting research on a topic and determines the research method that will be used. It therefore can be gathered that research methodology pertains to the strategies and tactics employed to properly present the findings of the study. It has to do with systematically planning of a study to ensure that the goals and objectives of the research are met. A research paper's methodology section enables the reader to assess a study's general validity and dependability critically. The section on approach provides answers to two primary queries: How were the data produced or gathered? What analysis was done on it?

Given the nature and scope of the study, which aims to explore renewable energy financing mechanisms in developing economies with a specific focus on South Africa, the research adopts a qualitative, non-empirical approach using Document Analysis. This method is appropriate for investigating existing policies, financing models, reports, and academic literature to extract meaningful insights into the effectiveness and challenges of innovative finance mechanisms for renewable energy in developing markets.

3.2 Research Paradigm

This study is grounded in an interpretivist / constructivist paradigm, consistent with an ontology of multiple, context-dependent realities and a subjectivist epistemology. Interpretivism and constructivism guides the methodology (Qualitative document analysis) by valuing context, depth and meaning. As Clark (2018) notes, interpretivist approaches highlight the subjective nature of reality and prioritize qualitative methods to uncover contextual nuances. This paradigm thus frames the research design and analysis; it assumes that the financing mechanisms under study emerge from social processes and that their meanings must be interpreted rather than measured.

3.3 Research Approach

An exploratory qualitative approach is adopted to examine innovative financing mechanism in South Africa’s renewable energy sector. This approach is appropriate, as the topic is relatively under-studied and complex, requiring open-ended inquiry to

uncover patterns and meanings. In practice, the study will use inductive analysis of textual data to generate themes, rather than testing pre-formulated hypotheses. Qualitative methods enable the researcher to capture rich, contextual detail about how various actors (government, financiers, developers) understand and implement new financing models. Merriam and Tisdell (2021) emphasize that qualitative inquiry centres on human experiences and values, not on quantification, which aligns with the goal of grasping the meanings and rationales behind financing decisions.

Data was gathered through qualitative document analysis. Following Morgan (2022), existing texts such as policy documents, financial reports, project case studies, and industry analyses will be systematically reviewed. Document analysis is an established qualitative method that is particularly practical and ethical for exploratory studies, it enables researchers to carry out investigations that they might not be able to finish otherwise (e.g. when field access is limited) and can mitigate challenges such as researcher – participant logistics and privacy concerns. In the South African context, many financing initiatives and regulatory decisions are recorded in public reports and official documents, which provides a rich secondary data source. Potts and Walwyn's (2020) study of South African concentrated solar power, for example, successfully used a qualitative, exploratory approach to understand systematic barriers in the energy sector. Similarly, this research paper will employ qualitative analysis to interpret the content of documentary data, seeking to generate insights about innovative finance that may not be evident from quantitative indicators alone.

The analysis will proceed using thematic coding of document content, whereby emerging codes relating to financing models, institutional incentives, or stakeholder roles will be iteratively refined against the literature on renewable energy finance. This inductive, qualitative strategy is well justified for this topic, as it embraces complexity (given that renewable energy finance is socio technical and multifaceted) and allows the study to synthesize diverse sources of information.

3.4 Research Design

Qualitative research is often associated with an interpretive philosophy (Denzin, 2018). It is interpretive because researchers need to make sense of the subjective and socially constructed meaning expressed about the phenomenon being studied. Such research is sometimes referred to as naturalistic since researchers need to operate

within a natural setting, or research context, in order to establish trust, participation, access to meaning and in-depth understanding, (Saunders et al., 2019).

Maree, (2015, p80) defines a research design as a plan or strategy that moves from the underlying philosophical assumptions to specifying the selection of participants, the data gathering methods to be used and the data analysis to be done. The choice of research design is based on researchers ontological and epistemological perspective, research skills and research practices, and influences the way in which they collect data.

According to Saunders et al., (2019, p187) exploratory research has the advantage that it is flexible and adaptable to change.

However, one of the disadvantages of exploratory research is that the multiple steps involved in the conduct of the exploratory sequential design (e.g. collect and analyse qualitative data, generate quantitative measures from the qualitative results, and test the quantitative measures) makes it a challenge for a researcher to design, implement and report. One challenge is that it takes time to implement all the steps of the study (Maree, 2019, p338).

The research design adopted for this study is qualitative and exploratory, leveraging document analysis as the core method of inquiry. This approach allows the researcher to examine and interpret pre-existing documents, including governments policies, international reports, academic articles, organizational publications, case studies, and market analyses. Document analysis is particularly suitable for understanding the historical, contextual, and institutional aspects of renewable energy finance in South Africa and other developing economies (Bowen, 2009.)

3.5 Data Collection Methods

This study uses document analysis as its primary data collection method. According to Bowen (2009), document analysis involves the systematic evaluation of documents to gain understanding and develop empirical knowledge. It is especially useful in qualitative research that examines complex policy environments and institutional processes. O'Leary (2017) emphasizes that documents can serve as rich, contextually grounded data sources, particularly when access to live stakeholders is constrained.

3.5.1 Document Analysis: To comprehend the current frameworks and practices in renewable energy financing in developing markets, including South Africa, the data for this study will be derived from secondary sources, using a comprehensive document analysis approach. Data sources include:

Government policy documents and white papers (e.g., Integrated Resource Plan, National Development Plan)

Reports by international institutions (e.g., IRENA, IEA, UNDP, World Bank, IFC, UNEP)

Industry publications and market intelligence reports (e.g., REN21, BloombergNEF, GOGLA)

Academic journal articles (peer-reviewed publications from databases such as Scopus, ScienceDirect, JSTOR, and SpringerLink)

Green finance frameworks, case studies, and project documentation (e.g., green bond issuances, PAYG models, donor-funded energy access programs).

3.5.1.1 Population

In document analysis, the term “population” refers to the universe of all potentially relevant documents. For this research, the population comprises documents produced between 2018 and 2024, providing insights into renewable energy financing trends, instruments, and adoption patterns in South Africa and comparable developing economies.

3.5.1.2 Sample and Sampling Method

A purposeful sampling method was used to select documents based on their relevance, credibility, and significance to the research objectives. Sampling criteria included:

Relevance to renewable energy financing in developing markets

Specific reference to South Africa’s renewable energy landscape

Credibility and authority of the source (e.g., peer-reviewed, institutional publications)

Publication within the last six years (2018-2024)

Approximately 20-30 documents were selected for in-depth review, ensuring a balanced representation of policy documents, scholarly work, and industry reports.

3.6 Research Instrument

According to, Maree (2019) when developing an instrument a researcher must use careful procedures to ensure that it adequately represents the qualitative results. A researcher also needs to use good procedures for developing and validating the instrument.

Taking the above into consideration, and for the purpose of gathering qualitative data, the following research instruments will be developed:

3.6.1 Document Analysis Protocol

The key research instrument in this study is a document analysis protocol, which guides the systematic review of each selected document. The protocol includes:

Identification of source and authorship

Document type (e.g., policy, academic, technical, financial)

Thematic relevance to research objectives

Key insights on financing mechanisms, challenges, outcomes, and policy frameworks

Coded categories and keywords for content analysis

3.6.2 Objective

To examine pertinent financial records, project reports, industry publications, and policy material.

Document Identification – Identification and collection of pertinent documents from NGO’s, financial institutions, government agencies, and renewable energy firms.

Content Analysis – Examination of documents to get details about finance options, project performance, policies pertaining to renewable energy, and socioeconomic effects.

Extraction – To extract important information from each document, such as policy frameworks, financial models, project outcomes, and problems, to which a standardised data extraction form (see Appendix (X) Instrument) will be used.

3.7 Data Analysis Strategies and Interpretation

This study uses Thematic analysis to analyse the data extracted from documents. Braun and Clarke (2021) describe this approach as a flexible method for identifying, analysing, and reporting patterns within qualitative data. It supports inductive reasoning, allowing themes to emerge from the data.

3.7.1 Qualitative Content Analysis:

Data was analysed through qualitative content analysis. The analysis involved:

Coding and categorization of text segments into thematic areas such as financing models, policy incentives, barriers, and opportunities

Thematic synthesis, where recurring patterns and relationship across documents were identified

Contextual interpretation, drawing comparisons across countries, regions, and technologies to understand the applicability of findings to South Africa

3.7.2 Interpretation:

Thematic: An analysis on the themes considering the goals and research questions. With discussions on insights into the difficulties, opportunities, and efficiency of innovative financing mechanisms.

Contextual Understanding: An explanation of the context and nuances of the themes, considering the socioeconomic, cultural, and policy environments.

Integration with Quantitative Findings: A comprehensive knowledge of the study problem will be achieved by contrasting and comparing the qualitative and quantitative data.

3.8 Quality Assurance

To ensure trustworthiness, this study employs Lincoln and Guba's (1985) criteria: credibility, transferability, dependability, and confirmability. Strategies such as triangulation of documents, a detailed audit trail, and reflexive memo's will support quality assurance.

3.8.1 Transferability

Transferability was ensured by selecting documents across multiple developing markets which provide comparative insights applicable to South Africa. The use of internationally recognized frameworks (e.g., UN SDGs, SEforALL, IRENA finance models) supports broader applicability.

3.8.2 Credibility

Triangulation: Combine quantitative and qualitative data to enhance and verify the interpretations of the findings. To strengthen conclusions and establish credibility, credibility was enhanced through triangulation, using multiple document types and cross-verification of information.

Negative Case Analyses: Actively search for and discuss instances or information that deviates from the current conclusions.

3.8.3 Dependability

Reliability was supported by using a standardized document analysis protocol and maintaining a detailed audit trail of all documents reviewed, coding structures, and analysis procedures to ensure replicability.

Audit Trail: All research efforts, including the stages involved in data collecting, coding, and analysis, would be meticulously documented.

Code-Recode Strategy: The qualitative data would be coded first, then recode after a while to make sure the coding procedure is consistent.

3.9 Ethical Considerations

Tracy (2020) highlights the importance of transparency, confidentiality, and accurate representation of findings even in document analysis. Although the study is based on publicly available secondary data, ethical standards was maintained by:

Ensuring accurate citation and referencing of all sources

Avoiding any misrepresentation of findings

Respecting intellectual property and data ownership

No human subjects were involved, and thus no information consent was required. Ethical clearance is not required for document-based research; however, adherence to academic integrity and citation norms were rigorously followed.

Chapter 4: Presentation of Findings and Discussions

4.1 Introduction

The findings of the document analysis are presented in this chapter, with an initial emphasis on South Africa's renewable energy financing context and then situating it alongside other developing country experiences (notably India, Kenya, and Nigeria). The research examines innovative financing mechanisms such as green bonds, public-private partnerships (PPPs), blended finance, and the Just Energy Transition Partnership (JETP) through thematic analysis. Where possible, findings are supported by country specific data or case examples (2020-2024) and organised in both text and summarising tables.

4.2 What are the most effective and commonly used alternative financing mechanisms for renewable energy projects in South Africa by situating it alongside other developing countries?

4.2.1 South Africa's Renewable Energy Financing Landscape

South Africa's energy system has long been dominated by coal, with the state-owned utility Eskom producing 95% of electricity. In the last decade, the government has sought to diversify into renewable energy to reduce emissions and enhance energy security. Key policies include South Africa' National Climate Change Response and updated Nationally Determined Contributions (NDC's), alongside competitive auction programs (e.g. the Renewable Energy Independent Power Producer Procurement Programme, REIPPPP) to crowd in private investment (Nel, 2015). In 2021, South Africa became the first country to launch a formal Just Energy Transition Partnership (JETP) at COP26, securing multilateral support for decarbonisation (Ramaphosa, 2021, as cited in Republic of South Africa, 2022). In President Ramaphosa's words, a "*just energy transition can attract investment, create new industries and jobs, and help us achieve energy security and climate resilience*" (*South-Africa_s-Just-Energy-Transition-Investment-Plan-2023-2027.pdf#_~_text=The Plan Is Clear That,Energy Security and Climate Resilience.Pdf*, n.d.)

Despite this policy momentum, meeting South Africa's climate and energy goals requires vastly more capital than currently mobilised. The South African JETP Investment Plan (2023-2027) estimates infrastructure and development needs of ZAR

1.48 trillion (USD 98.7 billion) (Argueta, n.d.). This exceeds by nearly tenfold the USD 8.5 billion pledged by international partners (Germany, France, UK, USA, EU) for 2023-207 (Argueta, n.d.). Even counting existing domestic and international financing, only 56% of the plan's needs are covered, leaving a 44% funding gap (Argueta, n.d.). These figures underscore the financing shortfall: innovative mechanisms will be needed alongside traditional public finance to unlock additional capital for South Africa's energy transition.

South Africa possesses relatively deep domestic capital markets by African standards. For example, institutional investors like the Public Investment Corporation (PIC) have begun funding renewables – the PIC reports adding about 2,500 MW of solar and wind capacity through its investments (*Landscape-of-Climate-Finance-in-Africa-2024.Pdf*, n.d.-a). However, high project risks and market barriers still prevail. An IEA assessment of African clean energy notes that "multiple barriers hinder the development of bankable clean energy opportunities" on the continent (*Financing Clean Energy in Africa – Analysis*, 2023) – factors that apply to South Africa as well. These include limited public funds (especially given debt pressures), high perceived sovereign, and utility risk, and evolving regulatory frameworks. Consequently, South African projects often face cost of capital several times higher than in advanced markets, slowing deployment (*Financing Clean Energy in Africa – Analysis*, 2023). Stakeholders also cite non-financial obstacles (policy uncertainty, grid constraints, bureaucratic delays) that deter investors. Overall, the secondary literature depicts a pressing need to expand and de-risk financing if South Africa's renewable sector is to grow rapidly.

4.2.2 Thematic Analysis of Innovative Financing Mechanisms

This section examines specific innovative financing tools as identified in the literature. For each, the research summarises the finance mechanism and then discuss how South Africa and other developing countries have applied it. Whenever possible, the research incorporates insights from India, Kenya, Nigeria, and others which are situated alongside South Africa.

4.2.2.1 Green Bonds

Green bonds are debt instruments whose proceeds are earmarked for projects with environmental benefits (e.g. renewable energy, energy efficiency, sustainable

transport). They follow ‘use of proceeds’ criteria and often third party certification to ensure climate objectives (APRI, 2024). In developing countries, green bonds can mobilise private capital by tapping into global sustainable investing trends.

South Africa: South Africa has been active in the green bond market. Several South African Banks and corporates have issued green labelled bonds to fund renewable projects and clean infrastructure (*Landscape-of-Climate-Finance-in-Africa-2024.Pdf*, n.d.-b). South Africa even led Africa in the number of green bonds issuances between 2019-2022 (*Landscape-of-Climate-Finance-in-Africa-2024.Pdf*, n.d.-b). Despite this progress, South Africa has not yet issued a sovereign green bond. Only Nigeria and Egypt have so far, with South Africa currently still in the process of developing a sovereign green bond. Notably, in 2022 South Africa published its Green Finance Taxonomy, laying the groundwork for standardized certification of green investments (*South-Africa_s-Just-Energy-Transition-Investment-Plan-2023-2027.pdf#_~_text=The Plan Is Clear That,Energy Security and Climate Resilience.Pdf*, n.d.). This taxonomy is intended to improve investor confidence and harmonise disclosure.

India: India’s green bond market is now the second largest among emerging Asian economies (*Landscape-of-Green-Finance-in-India-2024.pdf#_~_text=India’s Green Bond Market Is,Making It Easier to Attract.Pdf*, n.d.). The government of India introduced sovereign green bonds in 2022 to finance its climate projects, and securities regulator SEBI updated guidelines in 2023 to align with global standards (*Landscape-of-Green-Finance-in-India-2024.pdf#_~_text=India’s Green Bond Market Is,Making It Easier to Attract.Pdf*, n.d.). As a result, green finance flows reached approximately USD 50 billion in 2021/22, though only a portion was bond based. Strong policy support and a growing corporate bond market continue to attract investors. However, limitations persist due to the shallowness of India’s corporate bond market.

Kenya: Kenya has entered the green bond space on a smaller scale. Notably, Acorn Holdings issued a green bond in 2019 for student housing. By 2022, Kenya joined other African countries like (Egypt, Nigeria, and South Africa) in issuing corporate and diaspora green bonds (*Landscape-of-Climate-Finance-in-Africa-2024.Pdf*, n.d.-b).

Sovereign green bonds are still pending, though Kenya's capital markets authority has drafted supportive guidelines to foster future growth.

Nigeria: Nigeria was Africa's pioneer in sovereign bonds, launching a USD 30 million bond in 2017, followed by green sukuk (Islamic bonds) for renewable energy (*FSD-Africa-Impact-Nigeria-Green-Bonds-10.01.2024.pdf#_~_text=In December 2017, Nigeria Marked,Fair Trade for Green Bonds.Pdf*, n.d.). Its National Green Bond Programme, supported by the world bank and UNEP, has helped mobilize funding for off-grid solar and afforestation projects. However, macroeconomic challenges such as high interest rates and foreign exchange volatility continue to restrict the markets expansion.

Summary (Green Bonds): Table 4.1 below summarises key features. In sum, both South Africa and India have formalised green finance frameworks (taxonomies, sovereign bonds) to tap large pools of domestic and global capital. Kenya and Nigeria have made pioneering corporate or sovereign issuances, but their markets are smaller and still developing regulatory policy. In all cases, strong policy signals and transparent use of proceeds reporting are critical for building investor trust in green bonds.

Table 4.1. *Summary of Green Bond Developments and Drivers (2020-2024)*

Country	Market Status	Key Recent Actions	Barriers
South Africa	Active corporate market; sovereign bond *in progress.*	Published green finance taxonomy (2022); multiple bank/corporate bonds issued; anticipates sovereign green bond.	No sovereign issuance yet; limited bond market depth.
India	Rapidly Growing	Introduced sovereign green bond (2022); SEBI updated guidelines	Corporate bond market still developing; need

		(2023); strong domestic investor base	to deepen long term debt markets.
Kenya	Nascent	Private / corporate green bonds, drafting national guidelines	Small bond market; foreign exchange and credit risk.
Nigeria	Emerging	Issued inaugural sovereign green bond (2017); established Green Bond Market Development Programme.	Macroeconomic instability; high borrowing costs; limited investor confidence.

4.2.2.2 Public-Private Partnerships (PPPs)

In a PPP, government and private investors share the risk, responsibilities, and rewards of infrastructure projects. For energy projects, PPPs can leverage private capital, efficiency, and technology. However, success requires stable contracts and sound regulatory support to protect all parties.

South Africa: South Africa's flagship example is the REIPPPP (Launched 2011), a public tendering program that effectively operated as a PPP. Under REIPPPP, private firms bid to develop renewable energy plants and sell power under long term contracts to Eskom. The government created a special DOE-IPP office to oversee the program. This dedicated unit *"played the role of problem solver instead of regulator"*, building trust between the public and private sectors (Othman & Khallaf, 2022). By 2014 the program had secured USD 16 billion in private investment for 5,000 MW of wind and solar (Othman & Khallaf, 2022), making it one of the world's most successful renewable PPP models. Key success factors reported included: exempting IPP projects from standard PPP procurement rules; involving multilateral lenders (e.g. DBSA) to fund bids (thus "bidding windows" were budget neutral for government); and using a transparent competitive auction to drive down tariffs (Othman & Khallaf, 2022).

After 2018, however, REIPPPP slowed due Eskom's fiscal strains. More recently, the government has revived auctions (IRP2022/2023) but without special PPP exemptions. Continued investor confidence will depend on clear procurement rules and possibly new PPP structures, as South Africa reformulates its energy plan.

India: India has adopted PPP style models for some renewable energy initiatives. A notable example is Gujarat's Gandhinagar Rooftop Solar Program, which began in the 2010s. In this model, private developers financed, installed, and maintained rooftop solar systems, paying fixed fees to equipment owners. The program was backed by strong state policy support, simplified rooftop access, and attractive tariffs under the Jawaharlal Nehru National Solar Mission. This made it a cost-effective pilot for distributed solar in India.

In recent years, India has shifted toward competitive auctions for large scale solar and wind projects. These are often fully financed by private developers, reducing reliance on formal PPP contracts or concessional public funding.

Kenya: Kenya stands out for successful PPPs in geothermal energy, which require upfront investment. The Menengai Geothermal Project is a leading example. In that model, the state-owned Geothermal Development Company (GDC) drilled steam wells ("steam supplier"), Kenya Power purchased power, and Kenya Electricity Transmission built the grid. Three independent power producers (IPPs) then built and operated 105 MW of plants (GeoEnergy & Cariaga, 2024). This model effectively shared risks: public entities funded resource exploration, and private firms financed generation infrastructure.

Another example, the Olkaria III project, was led by the private firm Ormat under an IPP contract, supported by government and IFC guarantees. Analysts concluded that PPPs have been *"an enabler of project financing"* in Kenya's energy sector (GeoEnergy & Cariaga, 2024). Still, Kenya's PPPs face challenges such as currency volatility and evolving regulations. Experts emphasise that robust legal frameworks and clear risk sharing are key to sustaining investor interest.

Nigeria: Nigeria has less experience with formal PPPs compared to South Africa and Kenya. Its main energy PPP projects have been in conventional power. In renewables, a few solar and mini-grid projects have used concessionary financing or joint ventures, but without major PPP programs. The literature highlights Nigeria's regulatory and

credit constraints as barriers to PPP: for example, unclear power purchase rules and weak off take (grid) payments raise risks. Some analysts therefore recommend that Nigeria further clarify its PPP policies (as it has done in other sectors) to attract private developers in renewables (Peter Onuh et al., 2024).

Summary (PPPs): Successful renewable energy PPPs in developing countries depend on transparent procurement, risk allocation, and stable contracts. South Africa's REIPPPP, India's Gujarat rooftop scheme, and Kenya's geothermal projects illustrate different PPP models (standardised auctions versus state led concessions) that mobilised billions in private capital. Table 4.2 outlines PPP case highlights and challenges by country.

Table 4.2. *Renewable Energy PPPs – Case Examples and Issues*

Country	Case Study	Structure and Financing	Key Success Factors	Challenges / Risks
South Africa	REIPPPP (2011-2018)	Competitive auctions: IPPs financed plants; govt. guaranteed 20-year PPA; special DOE-IPP unit managed process	Dedicated procurement office; concessional bids funded by DBSA/donors; tariff decline through bidding	Eskom Financial distress; regulatory delays paused rounds (post – 2018); currency risk on debt.
India (Gujarat)	Gandhinagar Solar Rooftops (2014)	PPP delivery: Private consortia installed rooftop PV; state paid fixed fee/subsidy to owners.	Clear policy support; competitive bidding; minimal land issues(rooftops).	Scale limited to local pilots; needed strong state backing.

Kenya	Menengai Geothermal (2019-2024)	PPP Consortium: GDC drilled wells, IPPs built/operate plants; KPLC off-take; project financed by equity and DFI loans.	Shared resource risk (steam vs power plant); IFC/MIGA guarantees; credible off-take; balanced consortium roles.	Upfront drilling risk (borne by GDC); still exposed to FX and political risk.
Nigeria	(Limited formal RE PPPs)	Mostly small scale or solar mini-grids; few concessionary loans, no large-scale PPP programs.	-	Weak regulatory framework; no universal grid; high policy uncertainty.

4.2.2.3 Blended Finance

Blended finance speaks to the strategic use of concessional or public capital (grants, subsidised loans, guarantees) to attract larger volumes of private investment into projects that have high development impact but perceived high risk. In energy, this often means using multilateral funds or philanthropic money to absorb first losses or subsidise returns, making projects bankable for commercial lenders.

South Africa: South Africa has utilised several blended schemes, often via DFIs. For example, the Industrial Development Corporation (IDC) and the Development Bank of Southern Africa (DBSA) have provided concessional debt to utility scale renewable projects that otherwise could not get affordable loans. A concrete illustration is the Green Energy Efficiency Fund (established in 2012 by the Public Investment Corporation and Industrial Development Corporation), which offered below market financing for small renewables and energy efficiency. More recently, South Africa's National Treasury has explored structured facilities (e.g. offering credit guarantees or

co-financing) under the JETP framework to leverage private finance. However formal analyses of blended finance in South Africa specifically are limited. Qualitative reports (e.g. Germanwatch) note that bridging the JETP's 44% financing gap will likely require new instruments combining grants or guarantees with private equity (Argueta, n.d.).

Other Developing Countries: A recent report by IEEFA highlights how blended finance can de-risk smaller clean energy projects (like rural solar mini-grids) that struggle under conventional finance (*Blended Finance Key to Bridging the Energy Gap in Developing countries_Feb24.Pdf*, n.d.). India's energy transition has benefited from blended models too: for example, multilateral agencies (World Bank, ADB) have provided concessional lending and partial risk guarantees to build large solar parks and interconnection. The IEEFA study notes that in Asia, blended finance "provides a roadmap for interventions in renewable segments… which struggle to secure conventional finance (*Blended Finance Key to Bridging the Energy Gap in Developing countries_Feb24.Pdf*, n.d.). In sub-Saharan Africa, international initiatives (e.g. the Africa50 fund, World Bank energy access programs) are deploying blended funds to mobilize institutional capital for renewables.

Key insights: Blended finance is essential for bridging the risk-return gap. In developing countries, many projects are technically viable but fail to meet typical risk criteria for banks. Blended mechanisms can *"pool public and private capital in a risk-adjusted return structure, while adding an element of concessional capital"* (*Blended Finance Key to Bridging the Energy Gap in Developing countries_Feb24.Pdf*, n.d.). They essentially allow "commercial entities [to] focus on returns, while concessional layers absorb non-commercial risks." The IEEFA report argues that such structures can be a *"blueprint for other developing economies,"* especially for smaller scale or early-stage technologies.

Table 4.3 below lists selected blended finance examples. In summary, South Africa has used DFI's and national development funds to co-finance renewable energy projects, but could scale up greatly. Comparatively, India's large-scale projects often rely on multilateral concessions, and African countries are increasingly incorporating guarantees and blended debt for renewables.

Table 4.3. *Examples of Blended Finance in Renewable Energy*

Initiative / Mechanism	Description	Example Projects / Results	References
Concessional Loans & Guarantees	Public finance agencies lend at below-market rates or offer partial guarantees to reduce project risk.	**South Africa:** DBSA concessional debt for wind projects; NJFG (DAKAR/ADB) partial guarantees for Eskom exposure. **India:** World Bank loans for large solar parks; partial risk guarantees. **Kenya:** KfW/DFID loans for geothermal well drilling in Menengai.	IEEA (2024)
Equity & Fund Structuring	Public or DFIs take equity stakes or form investment funds to attract co-investors.	**South Africa:** Green Energy Efficiency Fund co-finances EE/Renewables. **Nigeria:** Bank of Industry's Renewable Energy Fund (50% concessional). **Africa:** Gaia Climate Fund offers secondary market liquidity to RE equity (Pilot).	CPI Africa 2024, IEEFA
Grants for Prep / TA	Grant funding reduces early stages costs (studies, capacity building) to make projects bankable.	**India:** Grants to state nodal agencies to prepare solar bids and PPA negotiations. **Africa:** EU/DFID grants for government PPP capacity building (e.g. Ghana, Zambia). **South Africa:** Some donor grants used for JETP capacity building.	CPI Africa (2024)

Blended Bond Instruments	Hybrid bonds combining concessional tranches with investors tranches.	(Emerging concept) Europe-ex-LAB fund (EIB/EDF) similar model (not yet in South Africa). **Nigeria:** Attempted "Green Bond Sukuk" (blended structure in 2017).	IEEFA (2024)

4.2.2.4 Just Energy Transition Partnerships (JETPs)

JETPs are a novel financing framework (announced first at COP26) where high income partner countries commit large scale support (grants, concessional loans, investment guarantees) to help a fossil dependent country decarbonize its power, while ensuring social justice (e.g. support for affected workers). In 2021 South Africa's JETP was inaugurated, and similar partnerships followed (e.g. Indonesia, Vietnam in 2022) with G7 backing.

South Africa's JETP: South Africa's JETP ("Just Energy Transition Investment Plan") sets out the projects and reforms needed for a just shift from coal. It highlights investments in renewable generation, grid upgrades, green hydrogen, and community transition initiatives (Argueta, n.d.). The core novelty is the commitment of USD 8.5 billion (by Germany, France, UK, USA, EU) to help finance the initial 2023-27 phase (Argueta, n.d.). However, this pledge covers only a portion of needs (as noted above). The South African Government has mapped out how donor funds will complement domestic resources and private finance. Germanwatch (2023) observes that existing frameworks must be deepened: *"new policy tools will be needed to close the financing gap that the JET IP identified".* In practice, the JETP has spurred some innovative financing: e.g. discussions of a South African sovereign green bond, potential carbon revenue usage, and credit enhancements provided by IPG donors.

Other JETP Countries: Indonesia's JETP (COP27) and Vietnam's (COP26) build on the South African model, with multiple bilateral donors pledging around USD 15 billion each. While India and Nigeria do not have formal JETPs, India has its own "Green Hydrogen Coalition" (with foreign partners) and ambitious solar targets financed by international programs.

Key Points: The JETP mechanism is notable as a structured climate finance instrument tying policy reform to funding. By linking new concessional funds to South Africa's published investment plan, it creates space for blending public and private flows. Nonetheless, analyst note that terms matter: South Africa must ensure support is concessional (to avoid unsustainable debt) and aligned with its priorities. JETPs also emphasise just transition aspects (Jobs, Social protection), adding complexity. Overall JETPs represent an emerging category of *"innovative financing"* by packaging development funds explicitly for clean energy transformation, with some conditionality but also above average support levels.

4.3 To explore and outline finance mechanisms, gaps, and barriers for renewable energy projects in South Africa by situating it alongside other developing countries.

The research analysis identified a range of finance mechanisms, gaps, and barriers that impede renewable energy projects in South Africa. These can be institutional, financial, or market related. Key gaps and barriers included have been situated along side developing countries:

4.3.1 High Perceived Risk and Cost of Capital: As noted, investors often perceive African projects as risky (currency, policy, credit), requiring much higher return. The IEA notes African clean-energy projects carry capital costs 2-3 times higher than in advanced economies. For South Africa, while its markets are relatively developed, Eskom's balance-sheet risk and sovereign rating pressure still elevate financing costs. Nigeria and Kenya similarly face high risk premiums due to currency volatility and weaker institutions.

4.3.2 Policy and Regulatory Uncertainty: Frequent changes to renewable energy policy (e.g. pause of REIPPPP, delays in tariffs, changes in tax incentives) have undermined investor confidence in South Africa. Kenya's PPP success partly stems from strong policy continuity (geothermal was a national priority for years). In contrast, Nigeria's renewable sector suffers from uncertain power purchase agreements and lack of feed in tariffs, deterring investors. Clear long term policy signals (e.g. guaranteed off take contracts) are needed everywhere.

4.3.3 Financial Market Limitations: Underdeveloped local capital markets limit access to long-term funding. South Africa has pension funds (like the PIC with 2.5 GW

deployed) but still relies on foreign loan for many projects. In Nigeria and Kenya, domestic bond markets are small, and local banks rarely lend for multi-year RE projects. Blended finance programs attempt to partially fill this gap but remain insufficient.

4.3.4 Institutional Capacity and Governance: Effective use of innovative finance requires strong institutions (for project selection, procurement oversight, etc.). The Germanwatch report criticizes South Africa's limited stakeholder engagement in designing JETP policies, which can weaken public support. Corruption, complex bureaucracy, or lack of trained staff can also impede project implementation (Nel, 2015). Comparatively, India's robust state agencies have managed large RE programs, while some African countries struggle with weaker governance frameworks.

4.3.5 Other Gaps and Barries: These include community opposition (land access issues), local currency mismatch (most finance in USD vs local revenue), and technical bottlenecks (grid constraints, permitting delays). Each country has its own profile: for instance, Nigeria's grid unreliability is a key hurdle, whereas Kenya's limit is often whether IPPs can secure drilling financing.

Table 4.4 below compares selected indicators and challenges across South Africa, India, Kenya, and Nigeria.

Table 4.4. *Country Comparison: Renewable Energy Finance and Challenges*

Aspect	South Africa	India	Kenya	Nigeria
Energy Mix	62% coal, 15% wind/solar (2022)	60% coal, 15% solar & wind (2022)	90% renewable (47% geothermal, 20% hydro, 20% wind/solar)	80% gas/oil (2020), minimal grid RE (5%)
RE Investment (2020s)	JETP plan needs USD 99bn (2023–27). Annual RE investment $2–4 billion (lower in recent years).	Tracked green finance USD 50bn/year (2021/22); strong growth from domestic sources.	Large geothermal and hydro projects financed via PPPs; annual climate finance small (~$0.5b).	Limited 0.3 USD b/year (2021); heavy reliance on multilateral/climate funds.
Key Financing Mechanisms	Competitive auctions (IPP), DFIs, JETP funds, (planned green bonds).	Auctions (Solar/Wind MNRE), IREDA/DBT subsidies, domestic green bonds (incl. sovereign 2022).	PPPs for geothermal, bilateral loan financing (JICA/KfW), emerging corporate green bonds.	Sovereign green bond (2017), diaspora bonds, concessional loans (World Bank/ADF); nascent PPPs in solar.
Main Barriers	Utility debt risk; changing RE policy; local currency depreciation; financing gap after JETP pledge.	Land and transmission constraints; local debt market depth; state level policy variations.	Currency and interest risks; limited concessional funds; off taker (KenGen/KPLC) credit risk.	Currency fluctuation; credit risk of NERC/EEDC; governance challenges; high upfront costs.

Aspect	South Africa	India	Kenya	Nigeria
Innovative Policy Tools	Draft Green Bond Framework; Green Economy Tax Incentives; Renewables Integration Infrastructure (Grid) plans.	Sovereign green bonds; Green Credit Guidelines by RBI; major funds (NCEF, GEF leverage).	Green bond guideline (draft); Emissions Trading discussions; PPP Act (2013).	First Climate Change Bill (2021); regulatory roadmap for mini grids; Presidential Carbon Trading roadmap.
Private Sector Role	Active IPPs in REIPPPP; pension funds (PIC) investing in renewables.	Large domestic firms (Tata, Adani, etc.) driving RE; foreign investment via banks/debt.	Local companies in geothermal IPPs; increasing independent solar developers (e.g. M-KOPA).	Growing off-grid solar start-ups; big corporates investing (e.g. Shell on gas); slow coal-to-gas shift.

4.4 What are the recommendations to address and overcome the gaps and barriers of innovative financing mechanisms for renewable energy projects in South Africa?

4.4.1 Strengthen Policy and Regulatory Certainty

Policy inconsistency and delayed implementation such as pauses in the REIPPPP programme and persistent licensing bottlenecks have significantly undermined investor confidence, reinforcing the need for stable, long-term policy frameworks that are essential for attracting private capital. To address these challenges, government should publish and consistently adhere to updated Integrated Resource Plans (IRPs) and procurement schedules, while legislating the roles and responsibilities of Independent Power Producers (IPPs), the National Transmission Company of South Africa (NTCSA), and the restructured Eskom to eliminate ambiguity in the regulatory environment (Anku, 2025). Additionally, establishing an autonomous regulatory authority dedicated to overseeing project procurement and power purchase agreements (PPAs) would further enhance transparency, predictability, and investor assurance, thereby supporting sustained private-sector participation in South Africa's renewable energy transition (Kouloukoui, 2025).

4.4.2 Accelerate Grid Infrastructure Investment and ITPs

Grid constraints remain one of the most critical barriers to renewable energy deployment in South Africa, with an estimated 20 GW of projects awaiting grid connection due to insufficient transmission capacity (RenewSA, 2023). Addressing these bottlenecks requires enabling Independent Transmission Projects (ITPs) through ring-fenced procurement processes supported by blended finance mechanisms to accelerate private sector participation. At the same time, fast-tracking the implementation of the Grid Infrastructure Development Strategy under the JETP is essential to ensure coordinated national planning and long-term network reliability. Introducing targeted grid use pricing incentives such as renewable energy zones and reduced wheeling tariffs can further attract private investment by lowering operational costs and prioritising grid access for strategic clean energy developments (Baker, 2017).

4.4.3 Expand Just Energy Transition Mechanisms with Community Ownership

Although the Just Energy Transition Partnership (JETP) emphasises inclusivity, there remain limited mechanisms to support meaningful community-led ownership and participation in renewable energy projects. Strengthening this dimension requires formal policy measures that mandate a defined minimum equity share for local communities such as 10–20% through trusts or cooperatives to ensure long-term social and economic benefits. Complementary grant support for community-based organisations developing mini-grids, solar cooperatives, and other local energy enterprises can further enhance participation, particularly in underserved areas (Nel E, 2023). In parallel, expanding impact investment funds that specifically target township and rural renewable energy entrepreneurship would create pathways for inclusive growth and broaden the socio-economic gains of South Africa's energy transition (Wolf, V. 2023).

4.4.4 Activate Domestic Capital Markets with Sovereign Green Bonds

South Africa's absence of a sovereign green bond represents a critical missed opportunity to mobilise large-scale domestic capital particularly given that institutional investors such as the Public Investment Corporation (PIC) manage multi trillion-rand portfolios well positioned to support renewable energy expansion. To unlock this potential, South Africa must finalise and operationalise its Sovereign Green Bond Framework in alignment with the 2022 Green Finance Taxonomy, thereby establishing clear eligibility criteria and strengthening investor confidence. Broadening participation through diversified instruments such as green sukuk and retail green bonds would expand the investor base and deepen market liquidity (IRENA, 2020). Complementary tax incentives, including accelerated depreciation or preferential tax treatment for certified green investments, would further enhance market uptake (Anku, 2025). Collectively, these measures would position sovereign green bonds as a catalytic mechanism for scaling renewable energy finance and accelerating South Africa's just energy transition.

4.5 Summary

Our secondary analysis reveals that South Africa has many enabling factors for renewable finance (strong institutional capacity, market reforms in recent years) but still requires new finance products to bridge its transition gap. Its green bond and PPP

experiences are relatively advances in the African context, yet both domestic and international experts emphasise the need to scale up blended instruments and ensure continuity of supportive policies. Compared to peers, India stands out of its large-scale domestic green finance (including sovereign bonds) and entrepreneurial PPP programs, while Kenya illustrates how targeted PPPs (especially in geothermal) can deliver major capacity with shared risk. Nigeria has made notable first steps (green sukuk, green bonds) but remains constrained by macro-risks.

Tables 4.1-4.4 have integrated key findings on instruments, barriers, and cross-country contexts. The thematic analysis underscores that no single tool is sufficient: each country's transition relies on a mix of public budgets, private capital, concessional funds, and innovative market mechanisms. In all cases, strong governance and stakeholder engagement are essential to translate policy into bankable projects. Our framework (Figure 4.1) distils these insights into a visual model, guiding how policy reform and financing tools collectively drive investment into renewable infrastructure.

Overall, the evidence indicates that while South Africa is pioneering several innovative approaches (especially via its JETP and REIPPPP legacies), it can further learn from other developing nations' experiences. For instance, India's move to sovereign green debt, or Kenya's financing of geothermal PPPs, illustrate scalable models. The challenge remains to adapt these lessons to South Africa's specific context – for example, by designing blended products that suit local markets, and by ensuring that global climate funds align with South Africa's economic constraints.

5. Conclusion

South Africa stands at a pivotal juncture in its energy transition journey, where innovative financing mechanisms will determine the scale and pace of renewable energy deployment. The research analysis reveals that while policy frameworks such as REIPPP and JETP provide a strong enabling environment, financing gaps persist, particularly for early stage, decentralised, and community-based projects. Mechanisms like green bonds, blended finance, and PPPs have shown global and local success, but their deployment in South Africa must be tailored to mitigate domestic challenges such as grid constraints, regulatory uncertainty, and macroeconomic risks. Evidence from other developing countries like India, Kenya, and Nigeria demonstrates that when supported by policy coherence and institutional coordination, private capital can be effectively mobilised to drive equitable climate resilient infrastructure.

To unlock South Africa's full renewable energy potential, a coordinated strategy is essential, one that deepens local capital markets, de-risks investment flows through public / private collaboration, and embeds equity and community ownership into financing structures. A just energy transition will require not only fiscal innovation but political will, data transparency, and inclusive participation across all levels of government and civil society. The conceptual framework developed in this study offers a lens through which future reforms and investments can be evaluated and scaled. If these pathways are pursued with commitment and clarity, South Africa can emerge not only as a leader in African clean energy, but also as a model for financing sustainable development in the Global South.

5.1 Summary of Findings

The study found that while South Africa has made significant progress in renewable energy deployment through initiatives like the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), financing challenges continue to constrain sectoral growth. Document analysis revealed that innovative mechanisms such as green bonds, blended finance, and public–private partnerships are increasingly being utilized to attract private investment and mitigate risk. However, institutional barriers, policy uncertainty, and limited access to affordable capital remain critical obstacles. Insights from other developing economies, such as India and Kenya,

demonstrate that strong policy coherence, transparent regulatory frameworks, and integrated financial innovation enhance investor confidence and project sustainability. Overall, the findings underscore the importance of institutional reform and innovative financing structures in achieving South Africa's just and inclusive energy transition.

5.2 Summary of Recommendations to Address the Gaps and Barriers

To strengthen renewable energy financing in South Africa, the study recommends establishing a stable and transparent policy environment that enhances investor confidence and minimizes financial risk. Expanding blended finance models that integrate concessional public funding with private capital can effectively de-risk large-scale renewable projects and attract institutional investors. Developing the domestic green bond market through tax incentives and simplified certification standards will further mobilize local investment. Enhancing institutional capacity within key financial and energy agencies is crucial to streamline project evaluation and implementation. Finally, promoting community-based financing mechanisms, such as microfinance and energy cooperatives, will improve equitable access to renewable energy while fostering social inclusion and local ownership.

5.3 Limitation

Several limitations are acknowledged in this study:

The absence of primary data limits the depth of stakeholder perspectives

Documents analysis may not reflect real-time changes or informal practices in project financing

The quality and comprehensiveness of documents vary, potentially affecting interpretive accuracy

Language and publication bias may exclude relevant non-English or unpublished materials

Despite these limitations, the triangulation of multiple reputable sources helps mitigate potential gaps and strengthens the validity of findings.

5.4 Suggestions for Further Studies

Further studies could examine how blended finance mechanisms combining concessional and private capital affect project bankability and risk mitigation in developing markets, particularly within South Africa's Just Energy Transition framework.

Additional research could investigate community-based and cooperative financing models (such as local green bonds or microfinance) to evaluate their potential in enhancing decentralized renewable energy access in rural South African communities.

Emerging areas such as blockchain-based green finance, carbon credit trading, and digital crowdfunding platforms warrant exploration to understand their scalability and regulatory implications in South Africa.

Quantitative comparative studies could assess the financial performance of projects financed under different models (e.g., PPPs vs. green bonds vs. traditional loans) to identify which structures yield higher efficiency or returns.

References

Anku, J. E. (2025). *Barriers to Renewable Energy Adoption in Sub-Saharan Africa: A Stakeholder Perspective*. https://doi.org/10.2139/ssrn.5087846

APRI. (2024, November 11). Easing Africa's climate crisis: Can green bonds help close the climate finance gap? APRI. https://afripoli.org/easing-africas-climate-crisis-can-green-bonds-help-close-the-climate-finance-gap

Argueta, B. (n.d.). The author is grateful to the reviewers Samson Mbewe, Gillian Hamilton, Malango Mughogho, Charlene Watson and David Ryfisch for their constructive and insightful comments and suggestions.

Baker, L., 2017. Commercial-Scale Renewable Energy in South Africa and its Progress to Date. IDS Bulletin 48. https://doi.org/10.19088/1968-2017.165

Bazilian, M., Sagar, A., & Detchon, R. (2018). Energy Access, Renewable Energy, and Climate Change Mitigation. *Annual Review of Environment and Resources*, 43, 303-328.

Blended finance key to bridging the energy gap in developing countries_Feb24.pdf. (n.d.).

Bowen, G. A. (2009). Document analysis as a qualitative research method. Qualitative Research Journal, 9(2), 27–40. https://doi.org/10.3316/QRJ0902027

Breitinger, L., Acharya, S., & Hegmanns, T. (2020). Crowdfunding Renewable Energy in Developing Countries: A Platform Perspective on Energy and Development. *Sustainability*, 12(9), 3790.

Braun, V., & Clarke, V. (2021). Thematic analysis: A practical guide. SAGE.

Climate Bonds Initiative. (2021). Green Bond Market Summary. Retrieved from https://www.climatebonds.net/resources/reports/green-bond-market-summary

Climate Investment Funds (CIFs). (2021). About Climate Investment Funds. Retrieved from https://www.climateinvestmentfunds.org/about

Climpson, A., Pettifor, H., & Hall, S. (2018). Green Bonds: A Key Tool in Financing the Transition to a Sustainable Economy. *World Resources Institute*. Retrieved

from https://www.wri.org/insights/green-bonds-key-tool-financing-transition-sustainable-economy

Dawson, D. C. (2019). *Introduction to Research Methods 5th Edition: A Practical Guide for Anyone Undertaking a Research Project*. Little, Brown.

Denzin, N. K. (2018). *The Qualitative Manifesto: A Call to Arms*. Routledge. https://doi.org/10.4324/9780429449987

Eberhard, A., & Naude, R. (2016). The South African Renewable Energy Independent Power Producer Procurement Programme: A review and lessons learned. *Journal of Energy in Southern Africa*, *27*(4), 1–14. https://doi.org/10.17159/2413-3051/2016/v27i4a1483

Financing Clean Energy in Africa – Analysis. (2023, September 6). IEA. https://www.iea.org/reports/financing-clean-energy-in-africa

FSD-Africa-Impact-Nigeria-Green-Bonds-10.01.2024.pdf#_~_text=In December 2017, Nigeria marked,Fair Trade for Green Bonds.pdf. (n.d.).

GeoEnergy, T., & Cariaga, C. (2024, March 20). *PPPs as an enabler of project financing for geothermal in Africa*. https://www.thinkgeoenergy.com/ppps-as-an-enabler-of-project-financing-for-geothermal-in-africa/

Green Climate Fund (GCF). (2021). What We Do. Retrieved from https://www.greenclimate.fund/what-we-do

Global Impact Investing Network (GIIN). (2021). Impact Investing. Retrieved from https://thegiin.org/impact-investing

International Finance Corporation (IFC). (2019). Renewable Energy Microfinance and Impact Investing. Retrieved from https://www.ifc.org/wps/wcm/connect/corp_ext_content/ifc_external_corporate_site/home

International Finance Corporation (IFC). (2020). Carbon Finance: A Guide to Carbon Finance. Retrieved from https://www.ifc.org/wps/wcm/connect/corp_ext_content/ifc_external_corporate_site/home

IEA. (2019). World Energy Outlook 2019. International Energy Agency.

IRENA. (2020). Renewable Capacity Statistics 2020. International Renewable Energy Agency.

International Renewable Energy Agency (IRENA). (2020). Renewable Energy Market Analysis: GCC 2020. Retrieved from https://www.irena.org/publications/2020/Sep/Renewable-energy-market-analysis-GCC-2020

IPCC. (2018). Special Report on Global Warming of 1.5°C. Intergovernmental Panel on Climate Change.

Landscape-of-Climate-Finance-in-Africa-2024.pdf. (n.d.-a).

Landscape-of-Climate-Finance-in-Africa-2024.pdf. (n.d.-b). Retrieved June 21, 2025, from https://www.climatepolicyinitiative.org/wp-content/uploads/2024/10/Landscape-of-Climate-Finance-in-Africa-2024.pdf

Landscape-of-Green-Finance-in-India-2024.pdf#_~_text=India's green bond market is,making it easier to attract.pdf. (n.d.).

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. SAGE.

Maree, K. (Ed.). (2015). *First steps in research* (2nd edition). Van Schaik Publishers.

Merriam, S. B., & Tisdell, E. J. (2021). *Qualitative research: A guide to design and implementation* (4th ed.). Jossey-Bass.

Morgan, H. (2022). Conducting a qualitative document analysis. *The Qualitative Report, 27*(1), 64–77. https://doi.org/10.46743/2160-3715/2022.5044

Nel E, Marais L and Mqotyana Z (2023) The regional implications of just transition in the world's most coal-dependent economy: The case of Mpumalanga, South Africa. *Front. Sustain. Cities* 4:1059312. doi: 10.3389/frsc.2022.1059312

Othman, K., & Khallaf, R. (2022). A REVIEW OF PUBLIC-PRIVATE PARTNERSHIPS FOR RENEWABLE ENERGY PROJECTS IN DEVELOPING COUNTRIES. *Proceedings of International Structural Engineering and Construction*, *9*(1). https://doi.org/10.14455/ISEC.2022.9(1).ENR-01

O'Leary, Z. (2017). *The essential guide to doing your research project* (3rd ed.). SAGE.

Peter Onuh, James O. Ejiga, Emmanuel O. Abah, Joy Ojodunwene Onuh, Christian Idogho, & Joseph Omale. (2024). Challenges and Opportunities in Nigeria's Renewable Energy Policy and Legislation. *World Journal of Advanced Research and Reviews*, *23*(2), 2354–2372. https://doi.org/10.30574/wjarr.2024.23.2.2391

Saunders, M. N. K., Lewis, P., & Thornhill, A. (2019). *Research methods for business students* (Eighth Edition). Pearson.

South-africa_s-just-energy-transition-investment-plan-2023-2027.pdf#_~_text=The plan is clear that,energy security and climate resilience.pdf. (n.d.).

Dawson, D. C. (2019). *Introduction to Research Methods 5th Edition: A Practical Guide for Anyone Undertaking a Research Project*. Little, Brown.

Eberhard, A., & Naude, R. (2016). The South African Renewable Energy Independent Power Producer Procurement Programme: A review and lessons learned. *Journal of Energy in Southern Africa*, *27*(4), 1–14. https://doi.org/10.17159/2413-3051/2016/v27i4a1483

Financing Clean Energy in Africa – Analysis. (2023, September 6). IEA. https://www.iea.org/reports/financing-clean-energy-in-africa

FSD-Africa-Impact-Nigeria-Green-Bonds-10.01.2024.pdf#_~_text=In December 2017, Nigeria marked,Fair Trade for Green Bonds.pdf. (n.d.).

GeoEnergy, T., & Cariaga, C. (2024, March 20). *PPPs as an enabler of project financing for geothermal in Africa*. https://www.thinkgeoenergy.com/ppps-as-an-enabler-of-project-financing-for-geothermal-in-africa/

Green Climate Fund (GCF). (2021). *What We Do. Retrieved from https://www.greenclimate.fund/what-we-do*

Global Impact Investing Network (GIIN). (2021). *Impact Investing. Retrieved from https://thegiin.org/impact-investing*

International Finance Corporation (IFC). (2019). *Renewable Energy Microfinance and Impact Investing. Retrieved from https://www.ifc.org/wps/wcm/connect/corp_ext_content/ifc_external_corporate_site/home*

International Finance Corporation (IFC). (2020). *Carbon Finance: A Guide to Carbon Finance. Retrieved from https://www.ifc.org/wps/wcm/connect/corp_ext_content/ifc_external_corporate_site/home*

IEA. (2019). *World Energy Outlook 2019. International Energy Agency.*

IRENA. (2020). *Renewable Capacity Statistics 2020. International Renewable Energy Agency.*

International Renewable Energy Agency (IRENA). (2020). *Renewable Energy Market Analysis: GCC 2020. Retrieved from https://www.irena.org/publications/2020/Sep/Renewable-energy-market-analysis-GCC-2020*

IPCC. (2018). *Special Report on Global Warming of 1.5°C. Intergovernmental Panel on Climate Change.*

Landscape-of-Climate-Finance-in-Africa-2024.pdf. (n.d.-a).

Landscape-of-Climate-Finance-in-Africa-2024.pdf. (n.d.-b). Retrieved June 21, 2025, from https://www.climatepolicyinitiative.org/wp-content/uploads/2024/10/Landscape-of-Climate-Finance-in-Africa-2024.pdf

Landscape-of-Green-Finance-in-India-2024.pdf#_~_text=India's green bond market is,making it easier to attract.pdf. (n.d.).

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. SAGE.

Maree, K. (Ed.). (2015). *First steps in research* (2nd edition). Van Schaik Publishers.

Merriam, S. B., & Tisdell, E. J. (2021). *Qualitative research: A guide to design and implementation* (4th ed.). Jossey-Bass.

Morgan, H. (2022). Conducting a qualitative document analysis. *The Qualitative Report, 27*(1), 64–77. https://doi.org/10.46743/2160-3715/2022.5044

Othman, K., & Khallaf, R. (2022). A REVIEW OF PUBLIC-PRIVATE PARTNERSHIPS FOR RENEWABLE ENERGY PROJECTS IN DEVELOPING COUNTRIES. *Proceedings of International Structural Engineering and Construction*, *9*(1). https://doi.org/10.14455/ISEC.2022.9(1).ENR-01

O'Leary, Z. (2017). *The essential guide to doing your research project* (3rd ed.). SAGE.

Peter Onuh, James O. Ejiga, Emmanuel O. Abah, Joy Ojodunwene Onuh, Christian Idogho, & Joseph Omale. (2024). Challenges and Opportunities in Nigeria's Renewable Energy Policy and Legislation. *World Journal of Advanced Research and Reviews*, *23*(2), 2354–2372. https://doi.org/10.30574/wjarr.2024.23.2.2391

Potts, S., & Walwyn, D. R. (2020). An exploratory study of the South African concentrated solar power sector using the technological innovation systems framework. *Journal of Energy in Southern Africa, 31*(2), 1–18. https://doi.org/10.17159/2413-3051/2020/v31i2a7725

Saunders, M. N. K., Lewis, P., & Thornhill, A. (2019). *Research methods for business students* (Eighth Edition). Pearson.

South-africa_s-just-energy-transition-investment-plan-2023-2027.pdf#_~_text=The plan is clear that,energy security and climate resilience.pdf. (n.d.).

Tracy, S. J. (2020). *Qualitative research methods: Collecting evidence, crafting analysis, communicating impact* (2nd ed.). Wiley-Blackwell.

UNDP. (2020). *Human Development Report 2020. United Nations Development Programme.*

United Nations Development Programme (UNDP). (2020). *Financing the 2030 Agenda for Sustainable Development. Retrieved from https://www.undp.org/content/undp/en/home/librarypage/sustainable-development-goals/financing-the-2030-agenda-for-sustainable-development.html*

United Nations Department of Economic and Social Affairs (UN DESA). (2019). World Economic Situation and Prospects 2019. *Retrieved from https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/WESP2019_BOOK-web.pdf*

United Nations Environment Programme (UNEP). (2021). *Emissions Gap Report 2021. Retrieved from https://www.unep.org/emissions-gap-report-2021*

United Nations. (2020). **Results-Based Financing for Clean Energy Transitions in Developing Countries*. Retrieved from https://www.un.org/development/desa/financing/sites/www.un.org.development.desa.financing/files/2020-06/UN_RBF_report_final.pdf*

World Bank. (2021). *Green Bonds. Retrieved from* https://www.worldbank.org/en/topic/greenbonds/overview

World Bank. (2019). *World Development Report 2019: The Changing Nature of Work. The World Bank.*

Wolf, V. (2023). *Enabling the Just Energy Transition in South Africa*.

Appendix A: Document Analysis Protocol

Objective:

To examine pertinent project reports, financial statements, industry publications, and policy papers.

Steps

1. **Document Identification**
    - Identify and gather relevant documents from NGO's, financial institutions, government agencies, and renewable energy firms.

2. **Content Analysis**
    - Review the documents to gather details about finance options, project performance, policies pertaining to renewable energy, and socioeconomic effects.

3. **Data Extraction**
    - Use a standardised data extraction form to document key information, such as financial models, policy frameworks, project outcomes and challenges.

Appendix B: Research Questions

Based on the research objectives, I have identified the following high-level research questions to guide the investigation:

1. **Primary Research Question:**

    - How are the innovative financing mechanisms for renewable energy projects implemented in South Africa by situating it alongside other developing countries?

2. **Secondary Research Questions:**
    - What are the most effective and commonly used alternative financing mechanisms for renewable energy projects in South Africa by situating it alongside other developing countries?
    - What are the key gaps and barriers to financing renewable energy projects in South Africa by situating it alongside other developing countries?
    - What are the recommendations to address and overcome the gaps and barriers of innovative financing mechanisms for renewable energy projects in South Africa?

Appendix C: Qualitative Phase Research Instruments

1. **Perception of Renewable Energy**
    - What are the primary obstacles that renewable energy initiatives in this region face?
    - What opportunities are there in this sector for the development of renewable energy?

2. **Financing Mechanisms**
    - What financing mechanisms are currently available in this region for projects involving renewable energy?
    - Are there any innovative financing mechanisms currently?
    - How successful are these mechanisms at advancing renewable energy initiatives?

3. **Challenges and Barriers**
    - What are the primary barriers preventing renewable energy financing?
    - What impacts do these barriers have on the creation and execution of renewable energy projects?

4. **Policy and Regulatory Environment**
    - How conducive is the current regulatory framework and policy to funding for renewable energy?
    - What adjustments or enhancements would you recommend?

5. **Community Impact**
    - What impact has renewable energy initiatives had on local communities?
    - What role do community-based projects play in the advancement of renewable energy?

6. **Outlook**

- What expectations do you have for this region’s financing of renewable energy in the future?

What advancements or changes are we expecting in the near future? (Open-ended).

Appendix D: Data Extraction Form for Document Analysis

1.	**Policy Frameworks:** • Description of renewable energy policies and regulations. • Key policy objectives and targets.	
2.	**Financial Models** • Description of financing mechanisms used. • Examples of successful financing models and case studies.	
3.	**Project Performance** • Outcomes and impacts of renewable energy projects. • Challenges and lessons learned.	

4.	**Socio-Economic Impacts** • Impacts on local communities and socio-economic development. • Role of community-based initiatives.	

Annexure E: Ethics Approval

Graduate School of Business Administration
University of the Witwatersrand, Johannesburg

Wits Business School

Wits Business School Ethics Committee
Constituted under the University Human Research Ethics Committee (Non-Medical)

Ethics Clearance Certificate

Ethics protocol number: WBS/BA2627706/749

This certificate is only valid with a legitimate ethics protocol number and signed by the Researcher (below).

This certificate is only valid if accompanied by formal permission from the relevant stakeholder(s).

Project title	Exploratory study of innovative financing mechanisms for renewable energy projects in South Africa
Investigator / Researcher	Mr Kesaven Moodley
Nature of Project	MBA (Research Article)
Decision of the Committee	Approved, provided stakeholders and participants are guaranteed confidentialty.
Issue Date of Certificate	13/08/2024
Expiry date	Date of submission of the project / research report
Chairperson	Dr Ayanda Magida ☎ +27 11 717 3953 ✉ ayanda.magida@wits.ac.za

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Declaration by Researcher

One copy must be signed by the Researcher and returned to the Chairperson of the Wits Business School Ethics Committee.

I fully understand the conditions under which I am authorized to carry out the abovementioned research and I guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I undertake to resubmit the protocol to the Committee.

K Moodley
Signature

30 June 2025
Date:

Annexure E: Turnitin Receipt

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Digital Receipt

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Page count:	64
Word count:	13,056
Character count:	87,982
Submission date:	30-Jun-2025 09:16PM (UTC+0200)
Submission ID:	2708495395



Exploratory Study of Innovative Financing Mechanisms for Renewable Energy Projects in South Africa.

Kesaven Moodley

Under the Supervision of

Dr Tsole Moloi

Research proposal submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Masters of Business Administration (MBA)

Johannesburg, 2025

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