



Exploring South Africa's Renewable Energy Programme and its Potential Role in Khutsong
Township Economic Development.

Student Name: Phemelo Michelle Mashamaite.

Student Number: 2386524

Module: PADM7213A.

Supervisor: Dr Kagiso Pooe.

Final Submission Date: 16 February 2024.

This research was submitted to the faculty of Commerce, Law, and Management, University of Witwatersrand School of Governance, in fulfilment of the requirements for the Master of Management in Public Policy Degree.

Student's Declaration.

I, Phemelo Michelle Mashamaite (Student Number: 2386524), hereby declare that this research dissertation, titled "Exploring South Africa's Renewable Energy Programme and its Potential Role in Khutsong Township Economic Development," is my own work and has only been submitted to the University of Witwatersrand School of Governance in order to fulfil the Master of Management in Public Policy course requirements.

Dedication.

I, Phemelo Michelle Mashamaite, would like to dedicate this study to my late queen mother, Lorraine Mokabai Mashamaite, a.k.a Mother of All Nations. I was beyond blessed to have you as my mother, prayer warrior and confidant. I was privileged to have shared you with many other children you were responsible for educating. Thank you for all the sacrifices you made to see me succeed and the pearls of wisdom you ushered in my life to pursue my academic and career aspirations.

Acknowledgements.

This Master Research Report would not have been accomplished without the love and spiritual support of my heavenly father, who blessed me with peace, comfort and a believing heart, continuously enlightening my mind with the power of the holy spirit that enabled me to execute the purpose he has ordained me to fulfil on earth. I thank him for preparing me to be discovered as an intellectual. I am overwhelmed in all humbleness and gratefulness to acknowledge my lovely aunt Stacey Mpati Mashamaite indeed *mmangwanaka o ne wa e tshwara thipa kafo bo galeng* (translates as a younger version of my mother who went to many lengths protecting my siblings and me) and lovely grandmother Rinah Mannthebe Mashamaite for being our family anchor and your powerful prayers, to my three younger brothers, Reagoboka, Thebe, and Motheo Mashamaite, who have inspired me to keep pushing boundaries, I hope my accomplishment will inspire you all to become exceptional young men in the near future. To Bab'Khuboni, my partner, thank you for your understanding and never-ending words of encouragement, above all, for always being there for me in the highest and lowest moments in my life words cannot express my gratitude.

I would love to acknowledge Dr T.K.(Kagiso) Pooe, my supervisor. Thank you for your unwavering support and guidance in helping me materialise my research interests into a reality. It would not have been possible without your constructive feedback, which helped structure and improve my master's thesis. To the great Prof Cotsa Hofisi, thank you for being my mentor, enhancing my academic journey not for once doubting my intellectual capabilities and always encouraging me to pursue one degree further.

I would also like to extend my appreciation to all the Khutsong township-based SMMEs who opened their doors and welcomed a stranger to delving into their business realities and the Merafong City Local Municipality who allowed me to conduct my research project amidst their operating hours. Their voluntary participation in this research project is highly appreciated; as to your participation, this project was successful.

I am incredibly thankful to the Human Sciences Research Council (HSRC) for the financial assistance contributed towards my research; therefore, the opinions and conclusions expressed in this study are those of the author and cannot be credited to the HSRC. Lastly, I would like to thank the Wits School of Governance staff for their indirect help with this research project.

Abstract.

The South African government has initiated the REI4P, a pioneering large-scale renewable energy competitive tender aimed at diversifying power generation through private sector involvement. This procurement strategy addresses the national service delivery of electricity insecurity by promoting alternative renewable sources. However, a notable gap exists in the planning and implementation systems of the REI4P, lacking a clear framework for integrating informal township-based SMMEs into the emerging renewable energy landscape. This study investigates how Merafong City can leverage the REI4P as a catalyst for LED to concurrently facilitate the seamless integration of Khutsong Township-based SMMEs. The research affirms the existence of regulatory frameworks that MCLM can leverage the REI4P into an LED initiative. Furthermore, it identifies the MCLM's potential to transform into a Local Renewable Energy Development Zone, offering a strategic solution to challenges linked with the impact of electricity insecurity in Khutsong SMMEs business operations. Addressing these challenges is crucial for alleviating poverty, reducing unemployment, and mitigating social issues such as crime and drug abuse in the township. Despite these potential benefits, the study highlights barriers to successful implementation, particularly the absence of a clear framework for integrating informal township-based SMMEs into the renewable energy landscape. Additionally, challenges in MCLM audit performance pose substantial obstacles to both renewable energy integration and the development of Khutsong SMMEs and LED. This research demonstrates the need for comprehensive strategies to address these barriers and maximise the positive impact of the REI4P on both economic development and social well-being in Merafong City.

Key Words: Renewable Energy Independent Power Procurement Producers Programme; Merafong City Local Municipality; Khutsong Township Economic and Skills Development; Local Economic Development.

Table of Contents.

Contents	
Student's Declaration.	ii
Dedication.	iii
Acknowledgements.	iv
Abstract.	v
Table of Contents.	vi
List of Figures.	xi
List of Tables.	xi
Acronyms.	xii
Chapter 1.	1
Introduction and Background.	1
The Potential Role of South Africa's Renewable Energy Initiative for Khustong's SMME Development and Township Economy.	1
1.1.Introduction.	1
1.2. Background.	2
1.3. Problem Statement.	4
1.4. Aim.	5
1.5. Research questions.	5
1.5.1. Main Research Question.	5
1.6. Research Objectives.	6
1.6.1. Main Research Objective.	6
1.6.2. Sub-Research Objectives.	6
1.7. Literature Review.	6
1.8. Central Theoretical Framework.	7
1.9. Research Methodology.	8
1.10. Research Ethical Considerations.	8
1.12. Report Chapter Outline.	9
1.13. CHAPTER SUMMARY.	10
Chapter 2.	11
Literature Review.	11
Local Economic Development and Township Economy: A Focus on the Role of Procurement and Renewable Energy Integration.	11
2.1. Introduction.	11
2.2. An Overview of Policy Incoherence and Its Effects on Local Economic Development.	11

2.2.1. Historical Context, Foundational Principles, and the Crucial Role of Local Economic Development in Empowering Local Communities.	12
2.2.2. Challenges and Prospects for Inclusive LED in South African Municipalities: Insights from Policy Incoherence and Procurement Issues Local Government.	13
2.3. Partial Renewable Energy Integration and Procurement Practices on Local Economic Development.	15
2.3.1. Renewable Energy Integration and the Interconnectedness of Energy and Economic Sustainability in South African Municipalities.	16
2.3.1.1. An Overview of Renewable Energy Integration and Municipal Initiatives.	16
2.3.1.2. The Evolving Renewable Energy Landscape, Business Models, and Economic Sustainability.	17
2.3.1.2.1. Renewable Energy Integration Procurement Practices.	18
2.3.2. An Overview of The State of Public Procurement Practices in Local Government.	19
2.3.2.1. The State of Public Procurement in South Africa's Municipalities.	20
2.3.2. Renewable Energy Integration Procurement Legislative Frameworks.	21
2.3.2.1. Key Renewable Energy Integration Legislative Frameworks.	23
2.3.2.1.1. The White Paper on Energy Policy, 1995.	23
2.3.2.1.2. The White Paper on the Promotion of Renewable and Clean Energy Development, 2002.	24
2.3.2.1.3. The White Paper on the Renewable Energy Policy, 2003.	24
2.3.2.1.4. The Integrated Energy Plan & the Integrated Resource Plan.	24
2.3.2.2. Key Public Procurement Legislative Frameworks.	25
2.3.2.2.1. The Public Finance Management Act, 1999.	25
2.3.2.2.2. Preferential Procurement Policy Framework, 2000.	25
2.3.2.2.3. Local Government Municipal Financial Management Act, 2003.	26
2.3.2.2.4. Broad-Based Black Economic Empowerment, 2003.	26
2.4. Effects of Electricity Insecurity on SMMEs: Implications for the Local Economy and Development Profile of Merafong City.	27
2.4.1. Effects of Electricity Insecurity on South African SMMEs.	28
2.4.2. Contextualizing Khutsong Township: An Overview of Merafong City 's Economic and Development Profile.	29
2.5: CHAPTER SUMMARY.	31
Chapter 3.	33
Research Methodology.	33
3.1. Introduction.	33
3.2. Research Setting.	34
3.3. The Research Design and Methodology.	36
3.3.1. The Qualitative Research Approach.	36

3.3.2. Case Study Method.	37
3.4. Research Population and Sample Criteria.	38
3.4.1. Population.	38
3.4.2. Sample.	39
3.5. Data Collection Strategy.	41
3.5.1. Semi-Structured Interviews.	42
3.5.2. Survey Questionnaire.	42
3.6. Data Analysis Approach.	42
3.7. Research Limitations, Delimitations and Feasibility.	44
3.7.1. Limitations.	44
3.7.2. Delimitations.	45
3.7.3. Feasibility.	47
3.8. The Research's Ethical Consideration.	47
3.9: CHAPTER SUMMARY.	48
Chapter 04.	49
Presentation of Findings and Discussions.	49
Exploring the REI4P Potential in Khustong's Township Economic Development: Leveraging REI4P for Inclusive Local Economic Development.	49
4.1. Introduction.	49
4.2. The Impact of Electricity Insecurity on Khutsong Township-based SMMEs.	49
4.2.1. Challenges of Electricity Insecurity in Optimising Khutsong Township-based SMME Business Operations.	53
4.2.2. Challenges of Electricity on Khutsong Townships' Local Economy and Development.	56
4.3. Exploring the Merafong City Leveraging the REI4P as a Catalyst for LED: Empowering Khutsong Township SMMEs.	58
4.3.1 The Role of Merafong City Local Government in leveraging the REI4P as a catalyst for LED.	58
4.3.2. Examining Merafong City's Rooftop Solar Radiation.	58
4.3.4. Amend the Merafong City Local Municipality Integrated Development Plan (IDP).	60
4.3.5. Craft a Climate Change & Renewable Energy Efficiency Strategy.	61
4.4. Contextualizing Merafong City 's Economic Development Profile and Potential Barriers of Renewable Energy Integration.	72
4.4.1. Merafong City 's Economic and Development Profile Contextualizing Khutsong Township.	72
4.4.2. An analysis of Potential Barriers of Renewable Energy Integration in Merafong City.	74
4.5. Key Legislative Frameworks that can operationalise the REI4P as an LED Initiative.	77

4.5.2. Leveraging Existing Legislative Foundations to Drive REI4P as a Catalyst for Local Economic Development.	78
4.5.2.1. The Integrated Resource Plan, 2003.	78
4.5.2.2. The Integrated Resource Plan, 2019.	80
4.5.2.3. Electricity Regulation Act (ERA), No. 4 of 2006: Amendment to Schedule 2 & The Electricity Pricing Policy, 2008.	81
4.5.2.4. Energy Act, No 34 of 2008.	83
4.5.2.5. Integrated National Electrification Programme (INEP) 2012/2013.	84
4.5.2.6. The Draft National Energy Efficiency Strategy, 2016.	85
4.5.2.7. The Local Government Municipal Systems Act (MSA), No. 32 of 2000.	86
4.5.2.8. Preferential Procurement Policy Framework Act (PPPFA) 2000: Preferential Procurement Regulation, 2017.	88
4.5.2.9. Township Economic Development Act 2022.	89
4.4.2.10. A set of rules, standards, and regulations will govern the implementation of the REIPPPP at the micro-municipal level.	90
4.6. Fostering Skills Development and Economic Growth in Khutsong Township's Economy Through the REIPPPP Strategy.	92
4.6.1. Introduction.	92
4.6.2. Khutsong Township-based SMMEs Renewable Solar Energy Skills and Knowledge Gap.	93
4.6.3. Merafong City REI4P in Khutsong's Economic and Skills Development.	98
4.6.3.1. Khutsong SMME Education,	99
4.6.3.2. Khutsong SMMEs Skills Development:	100
4.6.3.3. Khutsong SMMEs Development and Employment Opportunities:	102
4.7: CHAPTER SUMMARY.	103
Chapter 5.	105
Conclusion and Recommendations.	105
5.1. Introduction and Conclusion.	105
5.2. Recommendations.	106
5.3 Research Contributions.	108
5.4 Knowledge Gaps for Future Research.	108
Reference List.	109
Appendices	126
Appendix 1: Township-based Small Micro-Medium Enterprises (SMMEs).	126
Appendix 2: Types of Roofing Infrastructure.	130
Appendix 3: Merafong Local Municipality Officials: 1) Local Economic Development, 2) Water & Lights 3) Finance, and 4) SMME Business Development.	131

Appendix 4: Merafong Local Municipality Official :1) Skills Development.	132
Appendix 5: Participation Consent Sheet.	133
Appendix 6: Consent Form for Audio Recording of Study Participation.	134
Appendix 7: Merafong City Local Municipality Permission Letter.	135
	136
Appendix 8: Ethics Clearance Certificate.	136
	137
Appendix 9: Ethics and Title Approval Letter.	137

List of Figures.

Figure 3.1: A snapshot of the research interest area Khutsong.....	34
Figure 3.2: A snapshot of the research interest area Khutsong.....	34
Figure 3.3: A snapshot of the research interest area Khutsong South.	35
Figure 3.4: Khutsong SMMEs Sample Population.....	44
Figure 4.1: Khutsong SMMEs Business Operation Reliant on Electricity Security.	50
Figure 4.2: The Merafong City Local Municipality Direct Normal Irradiation (DNI).	58
Figure 4.3: The Gauteng Province and West Rand District Municipality Solar Radiation Map.	59
Figure 4.4: Khutsong SMMEs' awareness and knowledge about the REI4P.	76
Figure 4.5: Khutsong SMMEs REI4P Knowledge and Awareness Gap.	95
Figure 4.6: Khutsong SMME Owner's Interest in Green Education and Skills Development.	97

List of Tables.

Table 4.1: Thematic Analysis: Electricity Insecurity on Khutsong SMMEs, Local Economy and Development.	50
Table 4.2: The Merafong City Local Municipality Climate Change & Renewable Energy Efficiency Strategy Tactical Objective Number 1: Renewable Energy Development.	62
Table 4.3: The Merafong City Local Municipality Climate Change & Renewable Energy Efficiency Strategy Tactical Objective Number 2: Local Energy Governance.	64
Table 4.4: The Merafong City Local Municipality Climate Change & Renewable Energy Efficiency Strategy Tactical Objective Number 3: Electricity service and Business Model. .	65
Table 4.5: The Merafong City Local Municipality Climate Change & Renewable Energy Efficiency Strategy Tactical Objective Number 4: Municipal Own Energy Efficiency.	67
Table 4.6: The Merafong City Local Municipality Climate Change & Renewable Energy Efficiency Strategy Tactical Objective Number 5: Energy Efficiency in the Residential & Commercial Sector.....	69
Table 4.7: The Merafong City Local Municipality Climate Change & Renewable Energy Efficiency Strategy Tactical Objective Number 6: Energy Access for all.	70
Table 4.8: Thematic Analysis: Potential Barriers to Renewable Energy Integration in Khutsong Township.	74
Table 4.9: Thematic Analysis: Empowering Township SMMEs through Renewable Energy Education and Skill Development.	93

Acronyms.

AG	Auditor General
ATMs	Automatic Teller Machines
BA	Bachelor of Arts
B-BBEE	The Broad-Based Black Economic Empowerment
CBD	Central Business District
CEO	Chief Executive Officer
CIPC	Companies and Intellectual Property Commission
CO₂	Carbon Dioxide
CoJ	City of Johannesburg's
COP	Conference of the Parties
COVID-19	Coronavirus Disease
CSI	Corporate Social Investment
CSM	Case Study Method
DFFE	Department of Forestry, Fisheries and Environment
DHET	Department of Higher Education and Training
DHET	Department of Higher Education and Training
DNI	Direct Normal Irradiation
DoE	Department of Energy
EEDSM	Energy Efficiency Demand-Side Management
EMEs	Exempted Micro Enterprises
EPWP	Extended Public Works Programme
ERA	Electricity Regulation Act, No. 4 of 2006: Amendment to Schedule 2
ESI	Electricity Supply Industry
ESSP	Environmental Sector Skills Plan
ETA	Experiential Thematic Analysis
EWSETA	Energy and Water Sector Education and Training Authority
FBAE	Free Basic Alternative Energy
G20	Group 20
GCR	Gauteng City-Region
GDP	Gross Domestic Product
GGT	Growing Gauteng Together 2030
GHG	Greenhouse Gas
GIS	Geographic Information System
GRAP	South African Standards of Generally Accounting Practice
IDP	Integrated Development Plan
IEP	Integrated Energy Plan
IPA	Interpretive Phenomenological Analysis
IPPs	Independent Power Producers

IRP	Integrated Resource Plan
ISA	International Standards for Auditing
kW/h	kilowatt per Hour
LED	Local Economic Development
LEGS	Local Government Equitable Share
MCLM	Merafong City Local Municipality,
MEPS	Minimum Energy Performance Standards
MEPS	Minimum Energy Performance Standards
MerSETA	Manufacturing, Engineering and Related Services Sector Education and Training Authority
MES	Minimum Emission Standards
MFMA	Municipal Financial Management Act
MIG	Municipal Infrastructure Grant
MW	megawatts
NCCR	National Climate Change Response
NDP 2030	National Development Plan
NERSA	National Energy Regulator of South Africa
OCM	Optimum Coal Mine
OECD	The Organization for Economic Co-operation and Development
PFMA	Public Financial Management Act
PPPFA	Preferential Procurement Policy Framework Act 2000: Preferential Procurement Regulation, 2017.
Q	Quatre
REDZs	Renewable Energy Development Zones
REI4P	Renewable Energy Independent Power Procurement Producers Programmes
SA	South Africa
SAGEN	South-African German Energy Programme
SALAG	South African Local Government Association
SAPIVA	South African Photovoltaic Industry Association
SAREM	South African Renewable Energy Masterplan
SARETEC	South African Renewable Energy Technology Centre
SBI	The Small Business Institute
SCM	Supply Chain Management
SDF	Spatial Development Framework
SDG	Sustainable Development Goal
SDM	Sedibeng District Municipality
SETA	Sector Education and Training Authority
SHMT	Stakeholder Management Theory
SHS	Solar Home Systems
SLA	Service Level Agreement

SMEs	Small Medium Enterprises
SMMEs	Small Micro-Medium Enterprises.
SSEEG	Solar Small-Scale Energy Embedded Generator
Stats	Statistics
TA	Thematic Analysis
TER	Gauteng Township Economic Revitalization strategy
TNA	The New Age
UN	The United Nations
WRDM	West Rand District Municipality
WSSD	World Summit on Sustainable Development

Chapter 1.

Introduction and Background.

The Potential Role of South Africa's Renewable Energy Initiative for Khustong's SMME Development and Township Economy.

1.1. Introduction.

The evidence highlighted in the final report of Eskom's inquiry (2018:12) indicates that the South African power parastatal's high operational capacity that undertook a massive electrification campaign in 1994, to perform public functions such as producing, transferring, and distributing approximately 95% of South Africa's power, providing essential service delivery needs of citizens as a result of high calibre leadership with a soaring moral compass is captured by administrative corruption, the culture of non-payment and electricity theft these claims supported by Eberhard (2001:06). Consequently, the key factors that have brought it to its dysfunction promoting mediocre governance have evolved into a national service delivery crisis known as load-shedding, influencing good service delivery while concurrently infringing on citizens' fundamental rights outlined in section 5(1) of the National Energy Act 34 of 2008. To provide reliable and affordable electricity, characterised by an extrapolating effect on the operation of township-based SMMEs of Khutsong.

In an attempt to mitigate the shortfall in the grid demand power supply, the South African government proposed the adoption of the Renewable Energy Independent Power Procurement Producers Programmes (REIPPPs) energy technology initiative as an attempt to address the national service delivery crisis, according to Eberhard (2001:06). However, the proposed Electricity Supply Industry (ESI) municipal business model and the 2019 IRP, critical renewable energy economic blueprints adopted by the South African government to operationalise the REIPPPP, have not stipulated how township SMMEs within the local municipality jurisdiction comprising of township-based SMMEs that suffer the downside of Eskom's problems will be factored into the model and REIPPPP planning systems. There are limited studies on the role of the REI4P in strategically integrating informal businesses, such as Khutsong township-based SMMEs, to stimulate Local Economic Development (LED).

This research aims to explore whether the Merafong City Local Municipality (MCLM) can leverage the REI4P as a catalyst for LED to yield a deep understanding of such parameters in academic research.

1.2. Background.

According to Mbembe (2001:25) and Mamdani (1996: 05), South Africa was buttressed by the right of conquest, which overthrew and destroyed the political systems and native institutions in its crudest form to fulfil its instituting role to create an enabling environment to exercise colonial sovereignty by enacting the Native Land Act of 1913, which served as the first legislative prescript of territorial segregation, passed by the union of 1910 restricting native Africans into Bantustans comprising of rural and township communities characterised by grotesque living conditions, poor infrastructure and allocation of resource such as the case study area this research selected known as Khutsong. A township within the Carletonville Merafong City Local Municipality (MCLM), located on the outskirts of the West Rand District Municipality (WRDM), officially proclaimed as an African mining compound township in 1959 which can be conceptualised as a residential dwelling initially developed for a small population of mine workers. Characterised by the rapid growth of informal settlements and higher population densities, a local economy that has been predominantly sustained by a struggling gold and uranium mining sector is on the brink of collapsing.

According to the West Rand District Municipality's development profile and model (2020:23) and the Gauteng Township Economic Revitalization Strategy (2018:15), this township's economic mainstream was historically entrenched with conservative fiscal regulation and a resistant culture to lending township entrepreneurs start-up capital, making it extremely hard for Khutsong township SMMEs to compete with well-established companies within a monopoly, due to the nature of economic policies that tend to ignore the potential of township-based SMMEs, which face a lack of access to business networking, skills development, mentorship, financial support, and human capital while simultaneously suffering the consequences of Eskom's problems. The freedom charter redeemed South Africa, granting it the authority to make its independent decisions to shift its policy-making. Therefore, the post-apartheid government of 1994 needed to address the massive gap of underdevelopment and inequality left by the apartheid legacy of systematic marginalisation deliberately sought to underdeveloped rural and peri-urban areas, maintains van Niekerk (2012).

In light of a democratic dispensation, the post-colonial government through the Reconstruction Development Programme (RDP), the first social democratic welfare policy intervention that was aimed at eradicating and redressing the grotesque social, economic and geographic patterns of deprivation and inequalities that were inherited from the apartheid regime, according to the South African History Online (2019:01).

According to Mokoena (2019), Rogerson and Nel's (2016), Cohen's (2010:11), and Sibisi (2009:01), the RDP served as a cornerstone of government development policy, creating an environment for the democratic government to establish an essential tool aimed at creating an enabling and conducive environment to enhance South Africa's economic growth. Prioritising resource redistribution and promoting inclusivity by favouring previously disadvantaged groups, such as townships and their SMME businesses, in the national policy planning and implementation systems for local communities with a shared interest to form a collaboration working together. To improve the quality of their lives through activities that can help them achieve sustainable economic growth, conceptualised as Local Economic Development (LED) crafted to address the socio-economic injustices colonial sovereignty imposed on local communities in rural and township areas.

It is crucial to highlight that most South African municipalities comprise the township-based SMMEs that comprise township economies. They trace their origins to colonial sovereignty, which segregated and displaced proletariat human settlements on the outskirts and peripheries of central business districts to supply cheap labour to core economic centres within cities. Therefore, 80% of Gauteng's population resides in townships and informal settlements confined to the periphery of the Gauteng economy. According to Scheba and Turok (2019), their economy is captured by the consequences of their apartheid predecessors' economic and social marginalisation and is therefore suffering from persistent socio-economic challenges such as concentrated poverty and the absence of economic transformation, which continue to widen the inequality gap in a free democratic government. These informal economies are located far from economic opportunities and need more access to entrepreneurial networks, restricting their access to the formal market value chain. The effect of low investment in socio-economic welfare drives and contributes to the high unemployment, poverty, and inequality rates in South Africa.

It is essential to highlight that these townships simultaneously suffer from an extrapolating effect that disrupts mining and SMME business operations, a chronic and grotesque national service delivery crisis regionally recognised as load-shedding. The consequence suffered by township areas hinders their potential role in contributing to the South African economy through creating employment opportunities, reducing poverty, and creating economic wealth because they account for 17% of the Gross Domestic Product (GDP) according to Statistics (Stats) South Africa (SA) Quatre (Q) 2 (2021).

In 2008, the South African National Treasury conducted an extensive evaluation with the South African Network Infrastructure Review on electricity; therefore, Newbery and Eberhard (2008:05) highlight that the evaluation affirmed that more attention needs to be paid to reforming the South African energy sector, making it a significant issue of immense importance. According to Yuen (2014:12), the South African energy sector's current vertically integrated electricity supply industry model has been compromised by administrative corruption, a culture of non-payment and electricity theft. The White Paper on Energy Policy, 1998, and the White Paper on the Promotion of Renewable and Clean Energy Development, 2002, are a set of blueprints that acknowledge and inform the establishment of the IRP for 2010. An Energy Efficiency Demand-Side Management (EEDSM) resource plan was promulgated in 2011 in support of the voluntary pledge South Africa made to reduce its carbon dioxide emissions by 42% by 2025 at the Conference of the Parties (COP) 15 Climate Conference to combat climate change since Eskom is primarily dependent on a non-renewable resource such as coal, to produce and supply electricity maintains Zeng, Lui and Nan (2017). The reactive hybrid system of mixing energy is forecasted to provide a flexible grid power supply worth 8.5 billion dollars and financed by COP26 to mitigate the shortfall in the grid demand for power supply, according to Scholtz, Mulaudzi, Kitzinger, Mabaso, and Forder (2017:08) and the Renewables Global Status Report (2020:49).

1.3. Problem Statement.

The South African government faces a national service delivery crisis of electricity insecurity estimated to cost the economy R4 billion daily. It is important to highlight that 80% of Gauteng's population resides in townships and informal settlements and comprises SMME's informal economies.

That are confined to the periphery and characterised by weak credit histories and cycles of income inequality and social injustice heavily embedded in historical policy planning. This has made it extremely difficult for SMMEs to access business networking, mentorship, financial support, and human capital. Electricity is a cornerstone of the operation of informal economies, accounting for 17% of South Africa's Gross Domestic Product (GDP). Electricity security plays an active role in creating local economic wealth and employment opportunities and reducing poverty in informal economies. In response to addressing the national service delivery crisis of electricity insecurity. The South African government has launched a Renewable Energy Independent Power Producer Procurement Programme (REI4P), South Africa's first large-scale renewable energy competitive tender valued at 8.5 billion dollars. This programme aims to mobilise private companies through procurement to diversify power generation using alternative renewable sources. The central problem to be explored in this study emanates from the apparent oversight of the REI4P planning and implementation systems, which lacks a clear framework for integrating informal township-based SMMEs such as those of Khutsong. To partner and participate in a complex emerging renewable energy monopoly to stimulate Local Economic Development (LED).

1.4. Aim.

There are limited studies on the role of the REI4P in strategically integrating informal businesses such as Khutsong township-based SMMEs to stimulate local economic development. This research aims to explore whether the Merafong City Local Municipality (MCLM) can leverage the REI4P as a catalyst for LED.

1.5. Research questions.

1.5.1. Main Research Question.

1.5.1.1 How can Merafong City leverage the REI4P as a catalyst for LED and effectively integrate Khutsong Township-based SMMEs?

1.5.2. Sub-Research Questions.

1.5.2.1 How does electricity insecurity affect Khutsong township- based SMME development and the local economy?

1.5.2.2. What existing regulatory frameworks can Merafong City leverage to drive the REI4P as an LED initiative?

1.5.2.3. What economic and skills development opportunities can the REI4P as a catalyst for LED bring in Khutsong?

1.6. Research Objectives.

1.6.1. Main Research Objective.

1.6.1.1. Explore how can Merafong City leverage the REI4P as a catalyst for LED and effectively integrate Khutsong Township-based SMMEs.

1.6.2. Sub-Research Objectives.

1.6.2.1. Examine how electricity insecurity affects Khutsong SMME development and the local economy.

1.6.2.2. To analyse what existing regulatory frameworks Merafong City can leverage to drive the REI4P as an LED initiative.

1.6.2.3. Investigate what economic and skills development opportunities can the REI4P as a catalyst for LED bring in Khutsong.

1.7. Literature Review.

According to Kumar (2014:48), a procedural evaluative report-literature review is the most integral part of conducting research. This consists of information reviewed by a researcher in the scientific discipline they selected to use for their area of study. It will assist the researcher to clarify their ideas and establish theoretical roots that fit their study. This study's research agenda is centred around three critical broad themes, comprising an interdisciplinary nature as follows: The first theme, Local Economic Development and Township Economy centred around the impact of policy incoherence emanating from the past urban planning policies which informed the state of local economic development and its effects on township economies.

The goal is to argue the need to leverage the REI4P as a Local Economic Development activity to promote township economic development. The second theme analyses Partial Renewable Energy Integration and Procurement Practices on Local Economic Development. It stresses the importance of effective stakeholder engagement, risk management, and improved procurement systems to support sustainable energy development and economic growth. This theme aims to assess what the legislative and policy frameworks can be leveraged to operationalise the integration of the REI4P as an LED activity. The third theme examines the multifaceted effects of electricity insecurity, particularly load shedding, on Small and Medium-sized Enterprises (SMMEs) and its implications for the local economy and development profile.

1.8. Central Theoretical Framework.

Reed et al. (2018) and Freeman (2017) emphasise the significance of Stakeholder Management Theory (SHMT) in the realm of business ethics. Government organisations must consider this theory when establishing collaborations and partnerships. This study focuses on Merafong City's ability to leverage the REI4P to drive LED. According to Freeman, Kujala, Sachs, and Stutz (2017), the SHMT will provide valuable insights into how Merafong City, as a local government entity, can forge collaborative partnerships with diverse stakeholders to promote local economic benefits. It will also shed light on how Merafong City can involve Khutsong township-based SMMEs among other prospective stakeholders in the decision-making process, aimed at fostering effective communication and transparency and enabling these SMMEs and other stakeholders to influence the distribution of REI4P project benefits.

Lane (2006), Basu (2005), and Akpanku and Asgowa (2018) argue that addressing the national electricity service delivery crisis requires local municipalities to restructure their business models to leverage the REI4P into an LED initiative. Khutsong township-based SMMEs have the potential to become strategically integrated into the REI4P as rooftop solar photovoltaic (PV) small-scale electricity-embedded generators (SSEEGs). To either generate solar energy to help mitigate the effects of electricity insecurity on their business operation or sell the electricity into the grid-tied system to generate additional revenue. In this context, the SHMT will assist in understanding potential complexities that may arise. In collaboration and partnership agreements between Merafong City and the REI4P program stakeholders. It's worth noting that procurement procedures often deviate from decisions made by key stakeholders, as exemplified by Eskom's procurement of coal service providers. These deviations were found

to be unfair, lacking transparency, competition, and cost-efficiency. Exceeding Eskom's Procurement and Supply Chain Management (SCM) policy, as outlined in the Report of the Portfolio Committee on Public Enterprises on the Inquiry into Governance, Procurement, and the Financial Sustainability of Eskom (2018).

1.9. Research Methodology.

In exploring whether Merafong City Local Municipality has the potential to leverage the REI4P as a catalyst for LED. Strategically integrating Khutsong township-based SMMEs as beneficiaries aimed at helping them mitigate the effects of electricity insecurity on their enterprises. This study used a qualitative research method and adopted a Case Study Method (CSM). This study reviewed literature focusing on these critical themes: i) Local Economic Development and Township Economy, ii) Partial Renewable Energy Integration and Procurement Practices on Local Economic Development, and iii) Effects of Electricity Insecurity on SMMEs: Implications for the Local Economy and Development Profile of Merafong City.

The study used bi-structured research instruments from primary data collection comprising a survey questionnaire and semi-structured interviews. The sample population for this research initially included i) 60 Khutsong township-based SMMEs aggregated per retail category, primarily dependent on electricity for their business operation. ii) Merafong City's officials from various units align with the key themes of the above-mentioned research. It is important to highlight that the rationale behind selecting a qualitative research approach, data collection strategy, and other relevant research methodology sections will be covered and extensively discussed in the research methodology chapter (Chapter 3).

1.10. Research Ethical Considerations.

The researcher obtained ethical clearance from the University of Witwatersrand School of Governance Research Ethics Committee before heading to the field to undertake the study. It is important to highlight that the researcher acquired verbal permission to interview officials in the interim, awaiting an institutional permission letter from the acting Municipal Manager of the Merafong City Local Municipality, Ms L. Mere. To authorise engagement with local government officials as participants in this study. Issued on the 27th of March 2023 due to Executive Director being on sabbatical due to health-related issues.

1.12. Report Chapter Outline.

1.12.1. Chapter One: *The Potential Role of South Africa's Renewable Energy Initiative for Khustong's SMME Development and Township Economy:* This chapter provides an *Introduction, Background, Research problem statement, objectives and rationale* centred on exploring the potential role of South Africa's renewable energy initiative in Khutsong Township's economic development. It presented the study's problem statement, research questions, and objectives. This chapter also covered the appropriate research methodology to demonstrate how the researcher intends to collect and analyse data. This chapter concludes with a discussion of the ethical considerations that the researchers considered.

1.12.2. Chapter Two *Literature Review: Local Economic Development and Township Economy: A Focus on the Role of Procurement and Renewable Energy Integration.* This chapter presented an overview of policy incoherence and its effects on local economic development. Conducted a comprehensive documentary analysis of literature centred on the i) historical context, foundational principles, and the crucial role of local economic development in empowering local communities. ii) challenges and prospects for inclusive LED in South African municipalities to gain valuable insights about policy incoherence and procurement issues. iii) Partial Renewable Energy Integration and Procurement Practices on Local Economic Development. To delve into the intricate relationship between Renewable Energy Integration and the interconnectedness of Energy and Economic Sustainability within South African Municipalities.

Providing an overview of the evolving Renewable Energy Landscape, associated business models, and their collective impact on Economic Sustainability. iv) The researcher explored the effects of electricity insecurity on South African SMMEs and contextualised these issues within the unique economic and developmental landscape of Khutsong Township, encapsulating an overview of Merafong City's broader economic context.

1.12.3. Chapter Three: *Research Methodology:* The goal of this chapter is to provide a detailed overview of how the researcher intends to answer the research questions and objectives, as well as to outline how the proposed methodological approaches and data collection instruments will be used to help this study achieve its goal.

1.12.4. Chapter Four *Presentation of findings and Discussions*-Exploring the REI4P Potential in Khustong's Township Economic Development: The goal of this chapter is to present the findings on the objectives of this research: (i) Explore the potential of Merafong City to use the REI4P as a catalyst for LED and assess its strategic integration with Khutsong SMMEs to mitigate the effects of electricity insecurity on their enterprises; (ii)Examine the impact of electricity insecurity on Khutsong township-based SMMEs; (iii)Identify the strategic measures adopted by Khutsong township-based SMMEs to mitigate and cope with the impact of electricity insecurity; (iv) Assess the legislative and policy frameworks that can be leveraged to operationalize the integration of the REI4P as an LED; (v)Investigate how the REI4P, when integrated as an LED strategy, can contribute to economic and skills development within Khutsong Township and its economy; and (vi) Determine which Khutsong township-based SMME sectors could benefit from the integration of the REI4P as an LED initiative.

1.12.5. Chapter Five *Conclusion and Recommendation*: The goal of this chapter is to summarise the findings of this researcher in order to draw a conclusion as to whether Merafong City to use the REI4P as a catalyst for LED and assess its strategic integration with Khutsong SMMEs to mitigate the effects of electricity insecurity on their enterprises. Therefore, recommend necessary approaches Merafong City can adopt to leverage the REI4Pas a catalyst for LED to improve Khustong's township economic development.

1.13. CHAPTER SUMMARY.

This chapter outlined for the research work, discussing the introduction and background that informed the study's problem statement. This was followed by the research questions, statements of purpose, and conceptual framework. The chapter discussed the research methodology, the process of analysis the study will adopted, and the ethics taken into consideration.

Chapter 2.

Literature Review.

Local Economic Development and Township Economy: A Focus on the Role of Procurement and Renewable Energy Integration.

2.1. Introduction.

The preceding section has played a crucial role as a foundational chapter, setting the tone by introducing the background and context of this study. This literature review chapter undertakes a comprehensive documentary review of existing literature, conducting a critical analysis of various components of the secondary body of knowledge that has been published. The primary focus of this literature review chapter is to delve into the overarching objective of this study. Centred around exploring key ideas and concepts related to "Exploring South Africa's Renewable Energy Programme and its Potential Role in Khutsong Township Economic Development. These are Policy incoherence from past planning and policy implementation of renewable Energy Integration, Local Economic Development, Procurement Practice and Electricity Insecurity, which formed an integral part of this research. This chapter will i) unpack the impact of policy incoherence stemming from historical urban planning policies and how they have influenced the state of local economic development, scrutinising their ramifications on SMMEs businesses; ii) navigate the intricate terrain of renewable energy integration, local economic development, and procurement practices, and iii) delve into the multifaceted effects of electricity insecurity, especially the spectre of electricity insecurity, on SMMEs and their far-reaching implications for the local economy and development landscape.

2.2. An Overview of Policy Incoherence and Its Effects on Local Economic Development.

A brief overview of the literature on Africa's urbanisation dynamics and the economic power of African cities. Highlighted a lack of alignment of developmental states' national economic policy priorities with local economic development remains a significant challenge.

The OECD, United Nations Economic Commission for Africa, and African Development Bank (2022:28) literature used national economic development programs as an example of how they are centred around addressing education infrastructure and housing development issues.

Therefore, it indicated that their successful implementation fully depends on local government. Furthermore, the OECD, United Nations Economic Commission for Africa, and African Development Bank (2022:28) stipulated that many developmental states within Africa, fail to execute their desired economic development vision and often produce negative results due to centralised policy implementation that often overlooks awarding local government with responsibilities, funds, or resources. As a result, this practice limits their potential role and ability to play a significant role in helping their respective countries achieve local economic development after an initial overview of work relating to economic development in Africa. This study examines specific prior work about LED in South African municipalities.

2.2.1. Historical Context, Foundational Principles, and the Crucial Role of Local Economic Development in Empowering Local Communities.

A systematic review of literature by the following scholars Mbembe (2001:25), Niekerk (2017:45), Mamdani (1996:10) discussed the right of conquest, which overthrew and destroyed the political systems and native institutions in its crudest form. To fulfil its instituting role of colonial sovereignty, native Africans were restricted into Bantustans, comprising rural and township communities characterised by grotesque living conditions, poor infrastructure and allocation of resources. The post-apartheid government of 1994 needed to address the huge gap of underdevelopment and inequality. Left by the apartheid legacy of systematic marginalisation, which deliberately sought to underdeveloped rural and peri-urban areas. In light of a democratic dispensation, there was a need for post-colonial government to establish an essential tool aimed at creating an enabling environment for local communities with a shared interest. To form a collaboration working together to improve the quality of their lives through activities that can help them achieve sustainable economic growth, which can be conceptualised as Local Economic Development (LED). An essential tool that the South African democratic government crafted to address the socio-economic injustices colonial sovereignty imposed on local communities in rural and township areas maintains, the literature of Mokoena (2019).

According to Van Der Walddt, Khalo, Nealer, Phutigae, Van Der Walt, Van Niekerk, and Venter (2014:57), the enactment of this tool was informed by the White Paper on Local Government 1998. That served as a cornerstone to explore development in local government through municipalities committing to work with their local communities. To create sustainable human settlements. To improve their quality of life and meet the socio-economic needs of these

communities. The views of the scholars mentioned above are furthered by the literature of Govender and Reddy (2015), Sape (2018:26), and Van Der Walt (2014:57), who pursued research on the role of the White Paper on Local Government as a framework. It discovered that the act seeks to positively impact the livelihoods of communities within the municipal jurisdiction by offering substantive benefits to residents and communities by providing goods and services.

A working paper by Sibisi (2009:01) on making local economic development work in South Africa. Identified that the purpose of LED was to build and improve the capacity of local governments, aimed at improving the livelihoods of township economies and creating an enabling environment to promote sustainable development, employment generation, and economic growth. Therefore, it identified typical LED interventions practised up to date in South Africa, which are: i) improving the investment in local businesses and ii) encouraging the growth and development of township-based SMMEs. Consequently, the study discovered that the failure of most municipal LED drive interventions emanates from an institutional gap. This indicates that national policy planning and implementation systems are centralised, thus neglecting the institutional capability of local government, which has led to the majority of national government priorities aggravating social and economic exclusion. In many cases, private sector-led development opportunities within township-based local communities often side line non-traditional SMMEs from benefiting from the project to generate profits they can feed into their local economy.

2.2.2. Challenges and Prospects for Inclusive LED in South African Municipalities: Insights from Policy Incoherence and Procurement Issues Local Government.

An economic development specialist, Cohen (2010:18–26), conducted a comparative analysis of the first term of local government from 2000–2006 to the current term 2019–2022 to evaluate the key performance areas of LED. Namely basic service delivery, municipal transformation and organisational development, and municipal fiscal viability and management. The goal was to draw key lessons from implementing local economic development projects within South African local municipalities. Sibisi (2009:01) pursued similar work, conducting a brief comparative analysis of the various government administrations and their role in implementing initiatives. That can help the South African economy alter the structures of the apartheid predecessor in a democratic dispensation since 1994, from the Reconstruction Development Programme (RDP) to the Accelerated Shared Growth Initiative of South Africa (ASGI-SA).

Cohen's (2010:11) literature revealed that LED was a relatively new development concept for South Africa in light of a democratic dispensation. The study presented an overview of the key challenges facing local municipalities to illustrate the state of local economic development in South African municipalities, which is as follows: i) a lack of agreement on the function of LEDs and LED processes; ii) the difficulty of precisely aligning an LED strategy within the broader scope of Integrated Development Planning procedures and SMME development; and, finally, iii) a scarcity of planning tools and expertise; many practitioners are either unaware of or dismissive of some of the modern theories surrounding their use and execution. Consequently, such conservative attitudes hinder the successful implementation of the LED to address poverty and inequality.

Rogerson and Nel's (2016) literature focused on identifying key trends in South Africa's local economic development and discovered. The state of LED in South Africa is weak, and it is difficult to inform and support municipalities' LED strategic plans. As in the case of the Sekhukhune District Municipality, which lacked access to adequate data to inform its LED planning. The Nkonkobe Local Municipality struggles to coordinate LED to employment opportunities and promote local economic activities. The Ngaka Modiri Molema District Municipality's LED was reportedly dysfunctional and unsatisfactory. All the challenges mentioned above hinder the ability to implement the LED successfully. As a result, these municipalities' challenges hinder their ability to implement the LED successfully. Resulting in a negative impact on overcoming spatial inequalities that offer minimal radical economic transformation for SMMEs. Due to adopting the pro-poor LED approach, which is often fostered by municipal budget constraints.

When comparing the literature of Mokoena (2019), Rogerson and Nel (2016), Cohen (2010:11), and Sibisi (2009:01), their literary texts demonstrate a strong argument on the issue of poor policy coherence. Between the national and local spheres of government, which hinders local economic development. Therefore, the South African government needs to create a conducive environment. That will enhance economic growth, prioritising resource redistribution and promoting inclusivity. Favouring previously disadvantaged groups such as township SMME business owners in the national policy planning and implementation systems. To help the LED make a significant contribution to the growth of the South African economy through township economies.

The issues of poor policy coherence between national and local governments raised in Mokoena's (2019), Rogerson and Nel's (2016), Cohen's (2010:11), and Sibisi's (2009:01) literature demonstrate consequences that stem from centralised procurement and its impact of LED. Therefore, it anchored us to this study's primary objective to explore Merafong City's potential in leveraging the REI4P as a catalyst for LED. Aimed at creating an enabling environment for non-traditional informal township-based SMMEs such as Khutsong to be strategically integrated into a complex monopoly. As partners and participants in an emerging Renewable Energy market can serve as a pro-poor LED approach which is people-centred and community-based.

2.3. Partial Renewable Energy Integration and Procurement Practices on Local Economic Development.

The previous literature reviews sub-heading aimed to demonstrate how local governments' efficiency in implementing LED is captured by a plethora of challenges. That stems from historical planning where township economies were characterised by high unemployment and poverty rates, shortage of skilled workers, and lack of administrative, financial and resource capacity to drive LED. This mainly emanates from a lack of alignment between the two spheres of government. Namely national and provincial government's policy prescripts and frameworks, concerning creating an enabling environment for local municipalities to accelerate LED.

In this study, the REI4P planning and implementation process and systems were contextualised from an angle of "Exploring whether the Merafong City can leverage The REI4P as a catalyst to drive LED as it appears that the South African government has not thoroughly considered how it will create an enabling environment for non-traditional informal township-based SMMEs such as those of Khutsong. To partner and participate in a complex pro-market-based Renewable Energy monopoly. Where private sector companies are participating in South Africa's first large-scale competitive renewable energy tender process. This brings us to the next sub-heading, which will delve into legislative and policy frameworks for Renewable Energy integration and procurement practices that can be leveraged to operationalise the integration of the REI4P as an LED activity.

2.3.1. Renewable Energy Integration and the Interconnectedness of Energy and Economic Sustainability in South African Municipalities.

The REI4P can be understood as South Africa's first large-scale competitive tender process, designed by the government to help diversify the ESI capacity using private sector companies. Its goal is to generate 17,800 MW of electricity from renewable energy sources, such as solar PV, on-shore wind, and hydro. It is important to highlight that the key objectives of the REI4P are to i) promote sustainable development and climate action; ii) foster economic growth and attract Foreign Direct Investment (FDI); iii) ensure energy diversification and security; iv) reduce poverty and stimulate economic development; and v) promote good governance and service delivery.

2.3.1.1. An Overview of Renewable Energy Integration and Municipal Initiatives.

In recent years, South Africa has witnessed a growing demand for partially integrating renewable energy into local government operations therefore, which has spurred collaborative efforts between municipalities and various companies. The World Wildlife Fund (WWF) Technical Report (2015: 36) underscores the importance of these collaborations. It reveals the increased interest in leveraging renewable energy within municipalities. Emphasising the need to foster local economic development, support SMMEs, and create employment opportunities. One notable observation from the report is the apparent lack of engagement with LED units within municipalities, representing a missed opportunity in the context of the REIPPPP.

These LED units can potentially play a significant role in creating an enabling environment for non-traditional, informal, township-based SMMEs. Thereby allowing Khutsong SMMEs to participate in the emerging renewable energy market.

A comprehensive review of case studies and an examination of various municipalities and regions. Mararakanye, Kritzing, Steyn, and Rix (2018) highlight the innovative approaches adopted by municipalities to harness renewable energy, particularly from rooftop solar installations. A study conducted by Ntsoane (2017) was centred in the heart of the City of Johannesburg's (CoJ) Central Business District (CBD). This study aimed to assess the technological potential of the buildings within the CBD to harness solar energy through rooftop installations. The findings revealed a significant potential to generate solar energy, thus contributing to the electricity requirements of the CoJ. These findings emphasise the role of urban centres in shaping renewable energy integration strategies.

Makhathini's (2019) study demonstrates the viability of utilising rooftop photovoltaic (PV) potential across a spectrum of South African locations, encompassing residential, commercial, and industrial areas, to generate solar energy. These case studies emphasise the practical aspects of renewable energy integration into existing infrastructure.

The role of municipalities in shaping renewable energy integration strategies is exemplified by the South African-German Energy Partnership Discussion Paper (2017). This paper underlines local governments' need to adapt their fiscal and operational models. To accommodate emerging renewable technologies within the domestic electricity system, such as the REIPPPP. The South African-German Energy Partnership Discussion Paper (2017:22), focusing on the role of South African municipalities in renewable energy, reviewed the business model structure for procuring electricity. It highlights the notable growth of this model in South Africa. However, during its pilot phase involving 18 municipalities across five provinces, the model faced challenges and was phased out. These challenges were linked to fiscal constraints associated with constructing large-scale power plant systems for electricity production. This model encapsulates two critical types of electricity generators available to municipalities: embedded generators (prosumers) and Independent Power Producers (IPPs). It is crucial to emphasise that IPP business models have been gradually integrated into South Africa's energy landscape, with a powerful presence in the Western Cape. These ongoing transformations within the energy sector and the diversification of energy sources underscore the holistic perspective on integrating renewable energy into the South African energy landscape, extending beyond technological aspects and business models.

This literature review discussion highlights the evolving role of municipalities in renewable energy integration, the challenges faced by the procurement business model, and the ongoing diversification of energy sources. These insights contribute to the broader discourse on South Africa's renewable energy integration and procurement practices.

2.3.1.2. The Evolving Renewable Energy Landscape, Business Models, and Economic Sustainability.

Beyond the technical aspects and business models associated with renewable energy integration. A comprehensive understanding of the South African energy landscape extends to the role of local governments in promoting sustainability. Nijaki and Worrel's study (2012) explored procurement as a sustainable local economic development tool.

Their research demonstrated the potential for local government entities, including municipalities. To strategically employ procurement plans to advance green local economic development, underscoring the interconnectedness of energy and economic sustainability. Furthermore, Mukwarami, Mukwarami, and Tengeh's (2020) international business and globalisation publication used local municipalities as a case study. To shed light on the ramifications of ineffective local economic development on small businesses, often leading to their failure. This study emphasises the integral role of robust local economic development strategies in supporting small businesses' sustainability, thus reaffirming the interconnected nature of energy and economic systems.

Collectively, these case studies paint a comprehensive picture of the multifaceted integration of the REIPPPP in various municipalities and regions. Highlighting the evolution of energy procurement, the role of municipalities, and the interconnectedness of energy and economic sustainability. As South Africa continues to navigate its energy landscape, these insights serve as valuable contributions to the ongoing discourse.

2.3.1.2.1. Renewable Energy Integration Procurement Practices.

The South African government proposed adopting a municipal model to procure and produce 17800 MW of electricity from renewable resources, maintains the Renewables Global Status Report (2020:49). According to Winkler (2005), the key objectives of the Energy White Paper of 1998 are aligned with the 7th SDG. To secure power supply through diversifying the ESI utilising alternative renewable energy resources. To increase access to affordable electricity and stimulate economic growth by 2030 while managing the energy-related environmental impact to improve energy governance. A recent systematic peer-reviewed literature highlights the need to create an enabling environment for renewable energy technology.

The South African government must adopt a non-discriminatory business model, which will enable prospective independent power producers and procurement businesses to equally compete as outlined in the South African Economic Recovery Plan (2021:15). The literature reviewed supports the studies of Le Cordeur (2015:01) and Khumalo (2021:01). That the South African government's REIPs, officially launched in 2011, are expected to inject R45 million into the South African economy and socio-economic development. Aimed at procuring 13813 megawatts (MW) of alternative and sustainable energy sources to boost Eskom's electricity supply constraint.

Recent work by the South African-German Energy Premiership Discussion Paper on the Role of South African Municipalities in Renewable Energy (2017:06) highlights the South African energy sector amidst a multifaceted energy mix transformation. This is in alignment with sustainable development goal number seven. To secure sustainable, efficient, reliable, and affordable electricity through adopting the REIPPPP. To address the national service delivery crisis of electricity insecurity. That has materially infringed on citizens' rights to provide reliable and affordable electricity, as outlined in section 5(1) of the Energy Act. Thus affecting business operations, Township-based small business owners in Carletonville-Merafong City Local Municipality are among the group. The literature consulted highlights the proposed business model of integrating power and energy mix, involving municipalities acting as IPPs. Indicates that the South African government has not thoroughly thought of creating an enabling environment for non-traditional informal township-based SMMEs. Such as those of Khutsong to partner and participate in a complex renewable energy monopoly.

The literature consulted also indicates that the South African government needs to acknowledge and consider this. A set of implications can emerge from leveraging the REI4P to be operationalised as an LED activity in Merafong City, strategically integrating Khutsong-township-based SMMEs. Due to the apparent lack of engagement with LED units within municipalities. The South African-German Energy Premiership Discussion Paper on the Role of South African Municipalities in Renewable Energy (2017:06) highlighted that municipalities need to understand the operationalisation channels of IPPs fully.

2.3.2. An Overview of The State of Public Procurement Practices in Local Government.

In this section, we briefly reviewed the body of work related to the South African public sector procurement systems by Fourie and Malan (2020), whose study focused on the dilemmas and challenges faced by the South African public procurement environment. They maintain that public procurement plays a crucial role in expanding an economy and can be used as an indicator to measure the government's success in providing services. Thus, maintain that public procurement, which plays a crucial part in the expansion of an economy, can be used as an indicator to measure the government's success in providing services.

The literature reviewed (Fourie and Malan (2020), Ambe and Badenhorst-Wessie (2012), and Odahiambo and Kamau (2003)) highlights that the current South African public sector procurement system is captured by a plethora of challenges attributed to the implementation systems. That needs to be reinforced to become resilient and strong to serve as an efficient tool to provide goods and services. The author's literature argues that the outbreak of the global pandemic amended the existing procurement frameworks to a certain extent. Adopting emergency procurement procedures that were re-prioritized to ensure that the South African government provides timely, effective, and efficient service delivery. Fourie and Malan (2020) highlight that public procurement can be conceptualised as an indicator of economic growth and development, reflecting government efficiency. Therefore, the scholar's literature indicates that governments across the globe are increasingly acknowledging the capacity and role of public procurement in the productivity of the public sector.

2.3.2.1. The State of Public Procurement in South Africa's Municipalities.

Several studies have been conducted focusing on procurement at the local government level in a developmental state such as South Africa. Nokele and Shohola's (2022) study focused on procurement dynamics and threats in the South African government, including a practice-based approach. Recommending steps municipalities should take to strengthen their whistleblowing strategies and create independent institutions, with the primary purpose of preventing and combating procurement corruption at the local level of government. Sape (2018:1–136) conducted their research using the Emfuleni Local Municipality as a case study, investigating how effective the procurement systems used by the local municipality. Similarly, Motsiri's (2010: 1-22) study discovered that the Sedibeng District Municipality procurement systems require the incumbent Supply Chain Management (SCM) officials. To have a shortage of skills and need to attend several SCM workshops to acquire the capacity and knowledge to adequately handle local government procurement processes to improve service delivery within their jurisdiction.

Pooe, Mafini, and Makhubele (2014) conducted a qualitative study investigating municipal procurement challenges in South Africa. Therefore, the study's findings demonstrate that municipalities in South Africa continuously struggle to meet their procurement goals. Irrespective of the existence of policies and strategic interventions adopted to support public procurement.

The study argues that four major obstacles capture the public sector procurement landscape: i) a lack of training, ii) a lack of capacity, iii) a lack of transparency, and iv) a failure to adhere to the rules and regulations governing public procurement. In that light, the scholar recommended ways to deal with the performance gaps in municipal procurement that were found. These claims were supported by the following scholarly literature by Fourie and Malan (2020) aimed at understanding the current dilemmas and challenges within the South African public procurement environment. Therefore, their research argues that public sector procurement systems are captured by many challenges attributed to the implementation systems. Therefore, it needs to be reinforced to become resilient and strong enough to serve as an efficient tool to provide goods and services.

Fourie and Malan (2020) state that the South African public sector and local government procurement systems face multiple challenges. This claim is supported by findings outlined in the audit reports from the 2017 to 2019 financial years. Therefore, Pooe, Mafini, and Makhubele (2014) and Ambe and Badenhorst-Weiss (2012) literature identified common challenges. That hinders the effective and successful implementation of procurement systems and the provision of adequate service delivery in local government. These include but are not limited to: i) lack of appointing officials through a system of meritocracy. Hence, they lack the proper capacity, knowledge, and skills; ii) lack of consequence management emanating from non-compliance with key SCM regulatory frameworks and policies. That condones and promotes unethical behaviour and a lack of administrative accountability. Due to inadequate oversight, monitoring, and evaluation systems. These studies managed to provide insight into the government procurement landscape. The literature review informed the sub-research objective derived from the state of public procurement in South Africa's municipalities. It illustrated a need to assess the legislative and policy frameworks that can be leveraged to operationalise the integration of the REI4P as an LED activity.

This brings us to the sub-heading below. To understand the intricate relationship between renewable energy integration and the legislative frameworks governing procurement practices.

2.3.2. Renewable Energy Integration Procurement Legislative Frameworks.

The purpose of this literature review is to provide a comprehensive overview of the field of public procurement and supply chain management in a South African context.

This review is the foundation for understanding the intricate relationship between renewable energy integration and the legislative frameworks governing procurement practices. The literature is organised into two sections. The first section focuses on Nyawo's Study on IPPs that speaks to Renewable Energy Integration in South Africa: Nyawo (2019) conducted a notable viability study of Independent Power Producers (IPPs). Operating within the South African electricity supply market. This study unveiled the significant role played by the South African government in recent years. Emphasising the importance of creating regulations to diversify primary energy sources and reduce the nation's reliance on fossil fuels for energy production. The findings from this study lay the groundwork for understanding the evolving landscape of renewable energy integration in South Africa.

The second section examines procurement legislative frameworks and the government's role in South African procurement. It is derived from Eskom's Integrated report (2014), which highlights the rationale behind establishing legislative and policy frameworks in public procurement. It emphasises the need to prevent organisations from abusing their conferred legislative authority while performing public functions. These frameworks are designed to ensure government officials fulfil their duties without adversely affecting the constitutional rights of South African citizens. The legislative authority governing Eskom's operations is rooted in Section 217(1) of the Constitution of the Republic of South Africa Act No. 108 of 1996, which mandates a cost-effective, competitive, fair, equitable, and transparent public sector procurement system.

Several studies by Selema and Govender (2016), Sape (2018:39), Nyawo (2019:25) and Badenhorst-Wessie (2012) have explored the intricate dynamics of South African public sector supply chain management. Therefore, underscores the ongoing debate among public policy researchers and management practitioners, indicating the growing emphasis on public SCM's role in achieving socio-economic imperatives set by the government.

The insights gained from these studies contribute to our understanding of the contemporary landscape of public procurement and supply chain management in South Africa. In 1995, the public procurement reform initiative focused on two key issues: the "promotion of the principles of good governance," and the establishment of a "preference system to achieve specific socio-economic objectives."

It is important to highlight that the reform was underpinned by the introduction of the following legislative measures: i) the Public Financial Management Act (PFMA) and the Preferential Procurement Policy Framework Act, which served as the foundation for the change (PPPPFA), Fourie and Malan (2020).

According to Vabaza (2015:14), in 2003, the South African government adopted a comprehensive policy strategy further to reform the public procurement process within government entities. This strategy sought to strengthen the policy frameworks that govern public procurement in South Africa. It also aligned with the five general procurement pillars applicable in the public sector, namely: 1) value for money; 2) open and effective competition; 3) ethics and fair dealing; 4) accountability and reporting and equity, recognised as the Public Procurement Act. The literature of Nyawo (2019:25) and Glazewski (2004) helped identify the regulations crafted by the government to create an enabling environment for renewable energy integration in the climate of public sector reform as alluded to by Vabaza (2015:14).. In contrast, the literature of Seleemo and Govender (2016), Sape (2018:39), and Badenhorst-Wessie (2012) and Honiball (2013:42) provided a critical analysis of the legal framework for the promotion of renewable energy in South Africa. The literature consulted that speaks to legislative frameworks that inform renewable energy integration indicated crucial national government statutory frameworks to be used to enable the South African ESI to successfully implement the REIPPPP and those that can be leveraged to operationalise the integration of the REI4P as an LED activity are as follows:

2.3.2.1. Key Renewable Energy Integration Legislative Frameworks.

2.3.2.1.1. The White Paper on Energy Policy, 1995.

The literature on sustainable development and investments undertaken by energy experts and researchers, Filipova and Boulle (2019:09), Eberhard (2001:06), Honiball (2013:42) and Nyawo (2019:25). Highlights that the White Paper on Energy Policy (1998) was created by a small group of academics and government officials, observing international power sector reform. The White Paper on Energy Policy in South Africa, 1998, can be conceptualised as a proactive strategy and a national energy policy prerequisite outlined in the constitution of South Africa. It was created to ensure that national energy resources are used adequately to cater to the nation's needs to provide affordable and reliable electricity.

The White Paper on Energy Policy in South Africa, 1998, can be conceptualised as a proactive strategy updated in 2003.

2.3.2.1.2. The White Paper on the Promotion of Renewable and Clean Energy Development, 2002.

A body of literature reviewed by Newbery and Eberhard (2008:05), Yuen (2014:12), Scholtz et al. (2017:08) and the Integrated Resource Plan (2019:19) indicated the urgent need to eliminate coal-fired power generating capacity. It aimed to ensure that South Africa reaches a zero-per cent carbon emission goal. To secure a sufficient renewable energy supply in alignment with and support the international Climate Change Accord. Nyawo (2019:25) maintains that the South African government needed to develop a strategy outlining its vision, guiding principles, and tactical targets for promoting and implementing renewable energy. The White Paper on the Promotion of Renewable and Clean Energy Development was established in 2002 to demonstrate the nation's efforts to reduce greenhouse gas emissions,

2.3.2.1.3. The White Paper on the Renewable Energy Policy, 2003.

According to the Renewable Energy Transition in Africa Report (2021), leaders of developmental states within the continent. Need to ensure that their government utilises renewable energy sources to promote socio-economic growth while reducing climate change. These claims are supported by the literature of Hsu et al. (2017:29) and Adhikari (2021), who maintain that this can be achieved by adopting a multifaceted energy mix transformation strategy. In alignment with sustainable development goal number seven, to secure sustainable, efficient, reliable, and affordable electricity by 2030. Therefore, the White Paper on the Renewable Energy Policy of 2003 can be conceptualized as a regulatory framework. That can enable the South African energy sector to diversify power supply and energy security.

2.3.2.1.4. The Integrated Energy Plan & the Integrated Resource Plan.

A review of major studies relating to South African renewable energy by the following scholars, Ambe and Badenhorst-Wessie (2012), Honiball (2013:42) and Nyawo (2019:25) has confirmed that the Integrated Resource Plan 2010 is an economic recovery plan. It comprises three phases to overcome Eskom's load-shedding challenges and economic constraints. Mobilising all resources to a sustainable economic recovery trajectory through electricity wheeling or energy mix.

It is currently in the recovery and reform phase to help the government restore and build a sustainable, resilient, and inclusive economy. Prioritising energy security and diversifying energy sources to produce sufficient, reliable, and affordable electricity. To play a significant role in sustaining a stable economy as outlined in the South African Economic Recovery Plan (2021:15).

2.3.2.2. Key Public Procurement Legislative Frameworks.

2.3.2.2.1. The Public Finance Management Act, 1999.

According to a review of academic literature, strict expenditure control methods defined the conventional budgeting system. That forced the South African government to introduce a fiscal reform across the three spheres of government. According to Mkhize & Ajam (2006:761) and Sape (2018:27), it led to the enactment of the PFMA in 2000. The PFMA played a significant role in local government. Addressing the key challenges facing local municipalities, such as limited knowledge of sound financial management among elected public officials, to help prevent poor procurement. Thus, ensuring that officials engage and make administrative decisions that adhere to the principles of integrity in public procurement.

2.3.2.2.2. Preferential Procurement Policy Framework, 2000.

Myer's (2017) study was centred on understanding the purpose of the government's enactment of the Preferential Procurement Policy Framework, 2000. Therefore, it was discovered that it was introduced as a regulatory measure. To ensure that state organs do not discriminate or exclude people from competitive tender as a prospective goods and services provider. These claims are supported by Ambe and Badenhorst-Weiss (2012), who maintain that this regulatory framework was established as an oversight instrument. To oversee how public procurement policies are to be implemented.

Sape (2018:32) highlights that this legislation can be conceptualised as a tool that affects public procurement reform—to create an enabling environment for historically disadvantaged businesses and individuals to participate in the unfolding public sector tender bidding systems.

2.3.2.2.3. Local Government Municipal Financial Management Act,2003.

According to Sape (2018:28), this legislation was enacted for local government public finance reform. Tucker and Kamukwamba (2020:02), literature on public procurement and government contracts. Highlights that municipalities and their entities are subject to being regulated by the MFMA, which requires these entities to establish and implement their supply chain management. To inform and guide micro-municipal procurement to ensure compliance with Section 112(i) of MAFA, which aligns with the constitutional requirements of public sector procurement. Outlined in Section 217(2) of the Constitution of the Republic of South Africa Act 109, 1996. Stipulating that procurement systems must be competitive and cost-effective, transparent, equitable, and fair when procuring goods and services by a local municipality.

2.3.2.2.4. Broad-Based Black Economic Empowerment,2003.

Esser and Dekker's (2008) literature conceptualised Broad-Based Black Economic Empowerment (BBBEE) as an essential tool to enhance good governance and promote its principles. Therefore, this framework was created by the democratic government of South Africa aimed at addressing the grotesque racial imbalances fostered by colonial authorities. The BBBEE strives to ensure that when government institutions implement public policies or projects. They consider the interests of the communities they serve, thus empowering them to promote social investment. Ambe and Badenhorst-Weiss (2012) and Sape (2018:32) literature outlined that the purpose of the BBBEE is to create a good practice code. To guide the development of qualification criteria for the issuance of licences or concessions, the sale of state-owned enterprises, the formation of partnerships with the private sector, and the development and implementation of a preferential procurement policy. The policy review study on public procurement in the local government commissioned by the South African Local Government Association (SALAG) (2020: 04) revealed multiple local government regulatory challenges that have hindered public procurement's socio-economic developmental mandate.

The challenges identified are areas of concern when looking into the need for partial renewable energy and procurement practices. These are as follows: i) the failure of municipalities to screen contracted businesses and suppliers; ii) a lack of competitive rotational tendering, which limits the ability to promote fair tender awards to a pool of SMMEs iii) a lack of an integrated relationship.

Between the national treasury and the Department of Trade and Industry, on the need to promote and expose SMMEs' potential to compete with well-established companies within a monopoly, and, lastly, iv) SMMEs' lack of compliance with procurement rules and regulations.

2.4. Effects of Electricity Insecurity on SMMEs: Implications for the Local Economy and Development Profile of Merafong City.

In the South African context, electricity insecurity, in this study can be understood as a symptomatic policy approach adopted by the government, which initially introduced rotational power cuts. Over time, these power cuts have evolved into a nationwide service delivery crisis known as load-shedding. Drawing from the insights provided by Niselow (2019), Eberhard (2001), and Zeng, Lui, and Nan (2017), it is apparent that the effects of diminishing operational capacity within the electricity sector. Became evident to South Africa's commercial and industrial sector as early as 2007. These effects have had a pervasive impact on the fundamental rights of citizens, as outlined in Section 5(1) of the National Energy Act 3 of 2008. Particularly concerning the provision of reliable and affordable electricity. The repercussions of this insecurity have further extended to disrupt mining and business operations, while concurrently affecting South African households and SMMEs. This complex and interrelated set of challenges underscores the significance and urgency of addressing electricity insecurity in South Africa.

Several scholars (Qhobosheane (2018:09), Niselow (2019:01), Scheba and Turok (2019), Eberhard (2001:06), and Mokoena (2017:05). Examined the effects of Eskom's national service delivery crisis of electricity insecurity on municipal revenue, service delivery, and SMMEs, which make up township economies within local government jurisdiction. According to Von Ketelhodt and Wocke (2008), SMMEs account for 97% of operating businesses in South Africa, employing approximately 60% of the national labour force, contributing significantly to GDP, and having the capacity to hire 10 to 50 people. Thus, playing a significant role in contributing to the socio-economic future of developing South African local economies.

The paper by Mushongera, Nyuke, and Khanyile (2022:01) used secondary data associated with a question on energy in the sixth Quality of Life survey, which was carried out in Gauteng in 2020–21. Identifying the percentage of respondents who stated that they suffered weekly power outages in each geographic area.

In their recent literature on electricity interruptions in the Gauteng City Region (GCR), Mushongera, Nyuke, and Khanyile (2022:01) used a bar graph to illustrate a five-year analysis of respondents within a specified municipal jurisdiction within the Gauteng City Region experiencing frequent, lengthy rolling power cuts with an unreliable schedule.

2.4.1. Effects of Electricity Insecurity on South African SMMEs.

The literature of Lang (2019:01), Von Ketelhodt and Wocke (2008), and Makhddom, Nawaz, and Najero (2017) highlights that power interruptions affect the production process if the operating machines of businesses are interrupted midway, resulting in waste costs. Causing businesses to be less profitable while forcing them to reprioritise their financial budgets to accommodate the grotesque effects of power cuts. Thus, it causes SMMEs to inflate product prices to maintain their profit margins. At the same time, consumers suffer the consequences of footing the extra costs and rolling power outages. Consequently, SMMEs must still pay operational expenditures, install additional security measures, and forfeit potential revenue. To acquire alternative power supplies during load shedding and pay for the repairs or replacements of damaged electronic equipment caused by electric surges. It is important to highlight the issue of power outages having the capacity to adversely influence SMME's profitability, efficiency, liquidity, and solvency.

A significant number of authors, such as Vyas-Doorgapersad and Masibigiri (2022), Nelisiwe (2018:01), and Mtsahli (2014:20), Khumalo (2018:01), Qobo (2018:1) (Summer, 2011), Xhati (2016:27), and Moagi (2009:1), identified factors that have captured local municipalities' capacity to generate sufficient revenue and service delivery provision in the Gauteng City Region. Minnen's (2020: 01) inquiry during the national assembly supports the literature of Magubane (2019: 01), Arnoldi (2023: 01), and Eyewitness News (2022: 01), indicating that various municipalities are in a debt catastrophe. The audit report shows that as of July 31, 2020, the total debt owed by municipalities is R 46.1 billion. In contrast, the Merafong City Local Municipality accounts for R 700 million due to Eskom.

Arnoldi's (2023:01) literature claims that excessive rolling power cuts have a negative impact on South Africa's local government revenue collection and growth. Due to the high input costs incurred by SMME owners mitigating the effects of load shedding. Adopting alternative power sources such as generators is expensive to maintain. Due to exorbitant fuel prices that erode their profitability and change their attitude towards paying for basic services that fail to be

delivered. Consequently, this behaviour perpetuates the culture of non-payment and metre-bypassing, which manifest as factors that exacerbate the municipality's ability to generate revenue from rendering reliable service delivery such as electricity. Ryan's (2023:01) literature focused on how the excessive rolling of power cuts cripple's electricity sales for the majority of local governments, which account for 80% of their revenue generation. Van Zyl's (2023:01) literature argues that residents and SMME business owners complain about the grotesque impact of load shedding, which frequently causes municipalities to lose millions of dollars in revenue because they rely on reselling electricity. Snigh (2022:01) literature indicates that blackouts have a devastating effect on communities, businesses, and households within the jurisdiction of local government; thus, they have an electroplating effect on the provision of water supply as the water reservoirs require electricity to generate sufficient pressure to push water and supply residential pipes.

2.4.2. Contextualizing Khutsong Township: An Overview of Merafong City 's Economic and Development Profile.

This study only focuses on seven West Rand District Regional outcomes that are closely aligned with the purpose of this research, which is as follows outlined in the Merafong Local Municipality Draft Integrated Development Plan (2022:09): i) Economic development; ii) Institutional planning and transformation; iii) Sound financial management; iv) Environmental sustainability; v) Basic service delivery; vi) a skilled, capacitated, competent, and motivated workforce; and vii) ethical administration and good governance. This research's main objective informed the selection of these outcomes to explore the potential of Merafong City to use the REI4P as a catalyst for LED and assess its strategic integration with Khutsong SMMEs to mitigate the adverse effects of electricity insecurity on their enterprises.

The Merafong City Local Municipality case study area is classified as a category B municipality comprising 28 wards overseen by the executive mayor, municipal council chairperson, and chief whip. It is located in the south-western part of Gauteng province and falls within the scope of the outskirts of the West Rand District Municipality. It comprises Khutsong, which was officially proclaimed as an African mining compound township in 1959 and can be conceptualised as a residential dwelling originally developed for a small population of mine workers.

The West Rand District Municipality's development profile and model (2020:23), along with the Gauteng Township Economic Revitalization Strategy (2018:15), have outlined a set of characteristics that encapsulate Khutsong Township's economic landscape to be summarised as follows:

Historical Fiscal Regulations: The township's economic landscape is deeply rooted in a history of stringent fiscal regulations and a culture resistant to extending start-up capital to township entrepreneurs. This outcome created formidable obstacles for township SMMEs, making it exceedingly challenging to compete with well-established companies operating in a monopolistic environment.

Mining-Centric Economy: Khutsong Township's economic foundation primarily relies on mining Gold and Uranium. Despite this historical reliance, efforts to diversify economic activities beyond mining have been limited. This over-dependence on mining poses a significant risk to the area, as local mines are projected to reach the end of their operational lifespan within the next decade, potentially transforming the township into a ghost town.

Demographic, Education, Skills Development and Labour Profile: The Merafong City Local Municipality is home to a population of 197,520 individuals and exhibits an average household size of 2.8 people per household. This demographic trend is attributed to the inadequacy of the human settlements within the region, which is not a conducive environment for raising a family. This settlement originated from the historical framework designed to accommodate the working class in mine towns and township areas, as elucidated by Peberdy et al. (2017:230–233). The Merafong educational profile needs improvement, with only 9.35% of the population holding tertiary qualifications, while 28% have completed matric, and 58% have not finished their secondary education. Consequently, the statistical analysis of the Merafong educational landscape indicates a potential shortage of highly qualified and skilled individuals, estimated at 16%, with 60% of the semi-skilled population engaged in the formal employment sector. Notably, 86.9% of the population has access to electricity, although there are frequent power cuts.

Impact of electricity insecurity: As reported by Peberdy, Harrison, and Dinath (2017:230–233), these rolling power cuts have adversely affected various aspects of life in the township. Therefore, Khutsong Township experiences severe power cuts, which have dire consequences for its infrastructure quality, service delivery, economic growth, and investment opportunities.

These Merafong City Local Municipality, Khutsong township characteristics resonate with the literature of several scholars: Mbomvu, Hlongwane, Nxazonke, Qayi, and Bruwer (2021:02); Makhddom, Nawaz, and Najero (2017); Tamsyn (2019:08); and Agwa-Ejon (2015) maintain that township economies face a multitude of challenges characterised by weak credit histories and cycles of income inequality and social injustice heavily embedded in historical policy planning which made it extremely difficult for township-based SMMEs to access business networking, mentorship, financial support, and human capital, which stems from the conservative and resistant culture practised by traditional banks that exclude SMMEs from the start-up capital lending criteria. Apart from these shared challenges, township-based SMMEs suffer the consequences of Eskom's national service delivery crisis—load shedding—a strenuous outcome that impacts their ability to contribute to the South African economy through creating employment opportunities, reducing poverty, and creating economic wealth. Niselow's (2019:01) literature stated that rolling power outages can hinder a developing state's agenda and economy because scheduled power outages affect 0.5% to 1.5% of the country's GDP on business investment groups. It thus argues that load-shedding has an extrapolating effect on SMMEs because their machinery takes time to start up and may consume more electricity.

2.5: CHAPTER SUMMARY.

The chapter focused on three interdependent themes, namely Local Economic Development and Township Economy, providing a historical context for foundational principles and emphasising the crucial role of LED in empowering local communities. The chapter critically examined policy incoherence stemming from past urban planning policies, shedding light on how these policies have shaped the current state of local economic development and their impact on township economies based on the Challenges and Prospects for Inclusive LED in South African Municipalities.

This was followed by the second theme of Partial Renewable Energy Integration and Procurement Practices on Local Economic Development. The second theme shifts focus to Partial Renewable Energy Integration and Procurement Practices on Local Economic Development. It aims to assess the legislative and policy frameworks that can be leveraged to operationalise integrating the Renewable Energy Independent Power Producer Procurement (REI4P) as an LED activity. This includes an in-depth analysis of the interconnectedness of energy and economic sustainability in South African municipalities, exploring the evolving Renewable Energy Landscape, associated business models, and the state of public procurement practices in local government. To demonstrate the apparent oversight of the REI4P planning and implementation systems, needing a clear framework for integrating informal township-based SMMEs such as those of Khutsong. The goal is to partner and participate in a complex emerging renewable energy monopoly to stimulate LED.

The chapter's concluding section addressed the effects of electricity insecurity on SMMEs and their implications for the local economy and development profile of Merafong City. Contextualizing Khutsong Township within Merafong City's economic and development profile, the argument is made for exploring how Merafong City can leverage the REI4P as a catalyst for LED and effectively integrate Khutsong Township-based SMMEs. The following chapter explains the methodological techniques used in this research to explore South Africa's Renewable Energy Programme and its potential role in Khutsong Township Economic Development.

Chapter 3.

Research Methodology.

3.1. Introduction.

This chapter explains the methodological techniques used in this research to explore South Africa's Renewable Energy Programme and its potential role in Khutsong Township's economic development. The MCLM township economy of Khutsong was subject to intense scrutiny. This research embraces one of the conventional research methods, which, according to Kumar (2014:192), is embedded in the philosophy of empiricism and is known as the qualitative research method. That was scientifically established to help researchers explain events and how matters associated with them can affect people. The qualitative research approach will allow the researcher to analyse various issues, according to the objectives of this study, such as Exploring how Merafong City can leverage the REI4P as a catalyst for LED and effectively integrate Khutsong Township-based SMMEs. The research design, data gathering and data analysis methods are all covered in this chapter. It will also cover the legitimacy of the researcher's tools to gather data and address any ethical concerns that should be considered when conducting the study.

The primary objective of this research methodology chapter is to describe the chosen research approach and design. To explain the analytical processes employed for interpreting the collected data. It will also detail the data collection instruments and sampling techniques deemed most appropriate for this research. This chapter will also address the inherent research boundaries, encompassing limitations, feasibility constraints, and the researcher's positionality within the study. Furthermore, it will provide insights into the research process's ethical framework, emphasising the commitment to upholding the University of Witwatersrand's Non-Medical Academic Research Ethics.

3.2. Research Setting.

Figure 3.1: A snapshot of the research interest area Khutsong.



Source: Google Earth 2022 Maxar Technologies AfriGIS (Pty) Ltd CNES Airbus.

Figure 3.2: A snapshot of the research interest area Khutsong.



Source: Google Earth 2022 Maxar Technologies AfriGIS (Pty) Ltd CNES Airbus.

Figure 3.3: A snapshot of the research interest area Khutsong South.



Source: Google Earth 2022 Maxar Technologies AfriGIS (Pty) Ltd CNES Airbus.

Figures 3.1, 3.2, and 3.3 illustrate a snapshot map of Carletonville comprising Khutsong township and its SMMs. Both the areas mentioned fall within the Merafong Local Municipality jurisdiction under the West Rand District Municipality. It is essential to highlight that this area is situated at -26.366495° Latitude and 027.393894° Longitude.

This research selected a local economy predominantly sustained by gold and uranium mining as a case study. According to Peberdy, Harrison, and Dinath (2017:230–233), Khutsong township was officially proclaimed an African mining compound in 1959. The Khutsong township is located within the Carletonville-Merafong City Local Municipality, which is on the outskirts of the West Rand District municipality. Therefore, Khutsong is a significant research setting for this study because it has struggled to diversify and identify a sustainable local economic trajectory beyond an overused mining sector. These claims are assured in the Merafong Local Municipality Draft Integrated Development Plan (2022:32). Consequently, the government's mining sector companies in Carletonville were authorised to dewater the dolomitic karst aquifers discovered to reduce groundwater levels. Consequently, the decision to dewater dolomitic shafts in the 1940s caused detrimental effects on the geological sustainability of the Khutsong township land, which has caused karst-related sinkholes over the years. That has affected the infrastructure and has led to Khutsong homes being swallowed by sinkholes, maintains Seleka (2021: 01).

The geological challenges of sinkholes affecting the township areas led to Merafong City Local Municipality declaring a local state of disaster in 2016. Therefore, their declaration became a presidential priority to assist Merafong City's municipality in acquiring the necessary fiscal resources. To help rehabilitate sinkholes that destroyed the infrastructure in Khutsong aimed at mitigating the risks associated with dolomite and promoting economic activities. According to the West Rand District Municipality's development profile and model (2020:23) and the Gauteng Township Economic Revitalization strategy (2018:15). Khutsong township's economic mainstream was historically entrenched with conservative fiscal regulation and a resistant culture to lending township entrepreneurs start-up capital. Hence, it is tough for Khutsong township SMMEs to compete with well-established companies within a monopoly. The effects of poor policy coherence, which informed the enactment of past economic policies and planning, have resulted in ignoring the potential of township economies. Consequently, Khutsong SMMEs lack access to business networking, skills development, mentorship, financial support, and human capital. While simultaneously suffering the consequences of Eskom's national service delivery crisis of electricity insecurity and the environmental effects that emanate from the dolomitic karst aquifers, which have affected the soil.

3.3. The Research Design and Methodology.

3.3.1. The Qualitative Research Approach.

A research design can be conceptualised as a research pathway and a procedural, operational plan for research. That provides researchers with detailed information about various research approaches, methodologies, and processes they can apply to their research process, maintains Kumar (2014:122). According to Braun and Clarke (2014:21), transcendental phenomenology is a qualitative interactive mode of inquiry with a philosophical approach developed by Husserl to enable researchers to understand human experiences, to explore a phenomenon and how it is experienced by individuals setting aside (epoche) which is all preconceived ideas. Therefore, transcendental phenomenology enabled the researcher to provide a detailed and thick description of the shared perceptions and experiences of Khutsong township-based SMMEs. Regarding the impact of electricity insecurity on their business operations. The use of bracketing helped eliminate the researcher's own biases and assumptions. To avoid imposing any preconceptions or interpretations from the literature reviewed. The data analysis process of this approach is about how electricity insecurity affects Khutsong township-based SMMEs.

Thus, identify the strategic measures adopted to mitigate and cope with the impact on their business operation. Husserl's transcendental phenomenology informed the data analysis approach to conducting a thematic analysis by clustering, which entailed grouping the statements into themes based on the similarities and differences expressed by Khutsong SMME owners.

3.3.2. Case Study Method.

A case study can be understood as a robust social science research method that enables scholars to explore and conduct an in-depth investigation. To understand complex issues and contemporary real-life phenomena within a specified geographic location, as defined by Zainal (2007) and Crowe, Cresswell, Robertson, Huby, Avery, and Sheikh (2011). A case study can be understood as a qualitative mode of inquiry focusing on studying a single entity. In the real-life context of this study, a case study is defined as an analysis of a specific provincial area based within the West Rand District municipal jurisdiction. The Merafong City Local Municipality is disaggregated by multiple wards, including the Khutsong township, where SMME owners form part of the community. This Case Study Method (CSM) aims to contribute significantly and gather evidence to demonstrate how Merafong City can leverage the REI4P as a catalyst for LED. A noticeable gap exists in the South African government's REI4P plan, which is the lack of a comprehensive approach for fostering an enabling environment that allows non-traditional informal township-based SMMEs such as those of Khutsong to engage and collaborate within the intricate Renewable Energy monopoly actively. To avoid engendering similar diswelfares imposed by implementing past economic policies and planning.

According to Merafong Local Municipality's Draft Integrated Development Plan (2022:25) in the 2016 municipal financial year, the Merafong City local government's economic labour and economic performance profile reflected that 71% of its population fell under the non-active labour force. However, it was discovered that the municipality's low unemployment rate was due to high migration because people sought employment opportunities beyond the mining activities available within the municipal jurisdiction. Consequently, the unsustainable mining economy fosters the migration drive seeking employment elsewhere. As a result, commodity price and exchange fluctuations often lead to a decline in profit margins, causing mines to downsize and resulting in seasonal unemployment and job losses.

Furthermore, Peberdy et al. (2017: 230–233) stipulate that the economic performance of the Merafong local economy has been primarily sustained by gold and uranium mining since 1959, which has seen a significant decline in production and contribution to GDP. In an attempt to resolve the issue of unemployment, the municipality established a turn-around strategy for small business development. This plan identifies projects that can help improve the local economy's GDP through SMME development.

The Merafong City Local Municipality demographic, economic and labour profile report resonates well with the findings documented in Gauteng TER Strategy (2019:15), Tamsyn (2019:08), and Agwa-Ejon (2015), which highlighted that 80% of the Gauteng population residing in townships and informal settlements are confined to the periphery of the Gauteng economy. Therefore, its mainstream economy is entrenched in conservative fiscal regulation and a resistant culture to lending township entrepreneurs start-up capital, which makes it extremely hard for township enterprises. To compete with well-established companies within a monopoly due to a lack of access to business networking, mentorship, financial support, and human capital. While simultaneously suffering the consequences of Eskom's electricity crisis, which hinders the critical economic and social role SMMEs play in contributing to the South African economy and communities they serve, creating employment opportunities, reducing poverty, and creating an international, regional, and local energy sector landscape.

The researcher selected an independent qualitative research approach because it offers flexibility, which is not available with other qualitative research modes of enquiry. To fully understand the potential role of the Renewable Energy Programme of South Africa and its potential role in Khutsong township SMME economic development. The researcher used a qualitative research design, which allowed them to explore a single case within its real-life context, scrutinising the contemporary events concerned with the potential developmental role the REIPPP can bring about in the Khutsong township economy, Tichapondwa (2013: 115) and Ebneyamini and Moghadam (2018).

3.4. Research Population and Sample Criteria.

3.4.1. Population.

According to Chadwick (2017: 1284), identifying a population relating to your study is the most significant step that can enable a researcher to understand their topic of interest.

A population can be defined as a group of people or a set of individuals within the same geographical area or industry. Satishprakash (2020) described a population as consisting of an amalgamation, a totality, or a collection of all things that adhere to a set of requirements or share common characteristics. The population extracted from the Gauteng West Rand District for this research was categorised into six manager target groups, namely LED, Town Planning, Finance, Skills development; SMMEs Business Development Unit and Khutsong township-based SMME owners that form an essential part of the Merafong Local Municipality region, which encompasses Khutsong township.

3.4.2. Sample.

According to Satishprakash (2020), a sample is a fundamental component of a study population. The term "sample" refers to any subset of the population that can represent a specified population's various elements. A sample can also be understood as insignificant amounts of something that can provide information about what can be extracted from a population of a research interest area. A good sample should be concise and enable the researcher to realise their research objectives during the data collection and analysis to save time and avoid extraneous irrelevant data.

This study adopted a purposive sampling method informed by the research questions. This sampling strategy was based on selecting a proficient and well-informed population about the phenomena of this research interest. To provide the best possible information experience to help the researcher achieve their research objectives for this study, Kumar (2018:244) and Etikan, Musa, and Alkassim (2016). The first six target groups included specific managers of the Merafong Local Municipality within the following directorates: 1) Local Economic Development, 2) Finance, 3) Water and Lights, 4) SMMEs Business Development, and 5) Skills Development Units and 6) Supply Chain Management (SCM). These municipal organisational units played a vital role in developing appropriate municipal legislation and policies to guide the operationalisation of the REI4P as an LED plan to simultaneously encourage and promote economic and skills development within the Khutsong township and its economy. The purpose of selecting those mentioned above as a sample population was to find out from the officials whether Merafong City can leverage the REI4P as a catalyst for local economic development.

The purposive sampling method was extremely useful in this study because it aligns with the primary research objective of this study. The purposive sampling helped the researcher to eliminate extraneous data and save time to reach the data collection deadline.

The sixth target group that was selected to be interviewed were 64 voluntary Khutsong township-based SMMEs aggregated according to i) Region Khutsong and ii) Retail Category: Textile Upholstery & Clothing Designs, Hair and Beauty Salons, Fast Food Outlets and Catering Services, Spaza And Tuck Shops, Automobile, Panel Beaters & Welding Services Nursery or Preschools, Information Technology & Internet Cafes, Shebeen And Taverns. Bhorat, Asmal, Lilenstein, and van der Zee (2018:06) defined SMMEs as businesses established by entrepreneurs employing workers on their terms. SMMEs can be understood as companies that can hire 1-4 employees, referred to as micro-enterprises, while those with 5-9 employees are referred to as small enterprises, and those with 10-49 employees are recognised as medium enterprises.

The term SMMEs in the context of this study can be conceptualized as business enterprises established by entrepreneurs on their terms. They can be small, micro, or medium-sized businesses, depending on the number of hired employees. The definition of Bhorat et al. (2018) is further elaborated by the Department of Small Business Development (2023:10), which outlines that SMMEs are businesses comprising full-time paid employees, with micro-enterprises having a size of employees ranging from 0-10 and an estimated annual turnover of R 7 million. Small enterprises employ 11-50 workers with an estimated turnover of 17 million annually. It's important to highlight that the annual turnovers vary per SMME business sector.

In the context of this study, SMMEs are defined as businesses established by entrepreneurs on their business terms, employing between 1-10 employees. These businesses are not registered with the Companies and Intellectual Property Commission (CIPC), do not possess B-BBEE certification, or are registered in the National SMME Funding Database.

They are often susceptible to vulnerability and shutdown, especially compared to well-established formal businesses operating within a monopoly. The aggregation enabled the researcher to determine which Khutsong township-based SMMEs could benefit from integrating the REI4P as an LED initiative. The SMME owners fell within the sampling criteria outlined:

1. SMMEs located in Khutsong North and South. b) SMMEs that have been in operation for less than 12 months or more than 24 months; c) unregistered as an SMME with the Companies and Intellectual Property Commission (CIPC); d) SMMEs without B-BBEE certification; e) unregistered SMME in the National SMME Funding Database; f) SMMEs' business operations are entirely dependent on electricity; g) SMME with a high or low-rise building with enough space for a 1.6 m to 2 m tall by 1 m wide solar panel; h) Between 9 a.m. and 5 p.m. the SMME roof is exposed to approximately 6 hours of direct sunlight per day with no obstructions.

3.5. Data Collection Strategy.

To investigate the potential contribution of South Africa's renewable energy program to the local economic growth and development of Khutsong Township. It is crucial to emphasise that this study used primary data collected through semi-structured audio-recorded interviews and Qualtrics Survey software. The primary data collection tools helped the researcher i) explore the potential of Merafong City to use the REI4P as a catalyst for LED, ii) examine the impact of electricity insecurity on Khutsong township-based SMMEs, iii) Identify the strategic measures adopted by Khutsong township-based SMMEs to mitigate and cope with the impact of electricity insecurity and iv) determine which Khutsong township-based SMME sectors could benefit from the integration of the REI4P as an LED initiative. A comprehensive documentary analysis of secondary desktop credible literature published was also considered as a data-gathering strategy which helped the researcher i) Assess the legislative and policy frameworks that can be leveraged to operationalise the integration of the REI4P as an LED and ii) Investigate how the REI4P, when integrated as an LED strategy, can contribute to economic and skills development within Khutsong Township and its economy. As a population sample, a) LED, b) Finance, and c) Skills Development, d) SMMEs Business Development Unit were interviewed to explore whether Merafong City can leverage the REI4P as a catalyst for local economic development.

3.5.1. Semi-Structured Interviews.

Semi-structured interviews were conducted using 1) Khutsong township-based SMME owners and 2) managers from each of the following directorates within the Merafong City Local Municipality: 1) Local Economic Development, 2) Finance, 3) Water and Lights, 4) SMMEs Business Development, and 5) Skills Development Units and 6) Supply Chain Management (SCM) as a population sample. Were selected to help determine what municipal legislation and policies can guide Merafong City to leverage the REI4P operationalisation LED. Therefore, investigate how the REI4P as an LED strategy can foster economic and skills development within the Khutsong township and its economy.

3.5.2. Survey Questionnaire.

A qualitative online survey software Qualtrics enabled the researcher to distribute a survey they built to collect relevant data on Khutsong township-based SMME's interest to participate in the REI4P, subcontracted as rooftop solar PV SSEEGs to either sell electricity back to the grid through Merafong City to generate additional revenue or either store it to sustain their business operation amidst loadshedding. The software helped the research analyse responses collected in an affordable, convenient manner. The survey data collection method benefited the prospective participants since they may not have expert knowledge of the REI4P initiative.

3.6. Data Analysis Approach.

This research implemented a framework that is widely accepted in qualitative research to conduct a Thematic Analysis (TA), according to Braun and Clarke (2014:175) and Kiger and Varpio (2020). It typically comprises six steps: 1) familiarising yourself with the data, creating preliminary codes, 2) looking for themes, 3) looking over themes, 4) defining and labelling themes and 6) publishing the report.

According to Kiger and Varpio (2020), the critical characteristics of the role to be played by a TA primary data pattern-based analytical method helped the researcher to do the following: a) generate themes and concepts from collected data; b) assign meaning to the collected data; c) assign relevant data to themes or concepts emerging from the data to portray meaning; d) refine and distil abstract concepts; and finally, e) assign data to the redefined concepts to portray meaning.

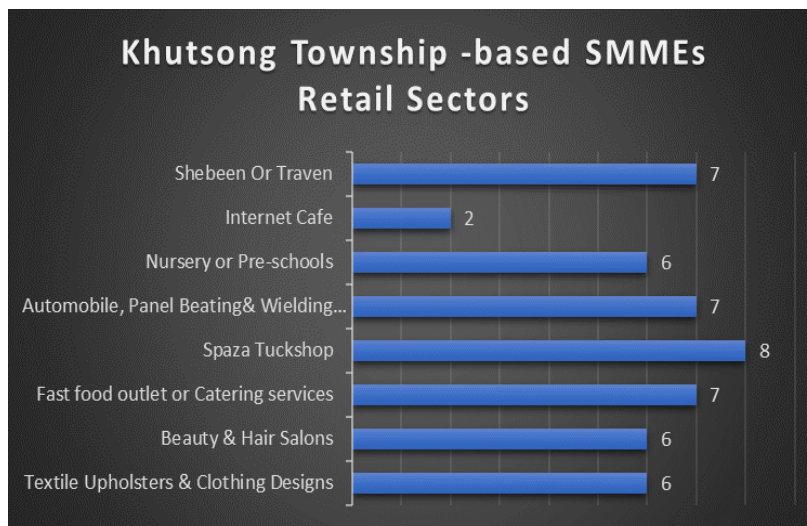
This research used thematic analysis, which can reduce audio data into usable themes and emergent conclusions. The thematic analysis technique was employed in this research to identify, analyse, and report patterns of meaning and themes across the primary data collected. Castleberry and Nolen (2018) define thematic analysis as a descriptive and flexible qualitative approach that reduces preliminary data and integrates with other data analysis approaches. Therefore, it is often used because it can help interpret and address various research questions. In this case, the experiential and interpretive phenomenological thematic analysis enabled the researcher to focus on how Khutsong township-based SMME owners portrayed their perceptions, emotions, and knowledge about the impact of electricity insecurity on their business operation and what strategies they have adopted to mitigate the effects.

The thematic analysis helped the researcher identify themes and patterns of meaning that emerged from an interview primary dataset, which was aligned to the following research objectives: i) to examine the impact of electricity insecurity on Khutsong township-based SMMEs and ii) identify the strategic measures adopted by Khutsong township-based SMMEs to mitigate and cope with the impact of electricity insecurity. The use of transcendental phenomenology enabled the researcher to provide a detailed and thick description of the shared perceptions and experiences by bracketing to eliminate one's own biases and assumptions and to avoid imposing any preconceptions or interpretations aimed at strengthening the consistency of the literature review chapter sub-heading titled Effects of Electricity Insecurity on South African SMMEs from a township perspective.

This data analysis technique helped the researcher examine the following: i) commonalities such as social location, opinions, and experiences of Khutsong township-based SMME owners. ii) differences that emerge from the data by identifying the relevance of any difference; and lastly, iii) the relationships of SMME owners to public-private partnerships and Merafong City local municipality. This qualitative pattern-based data analysis technique helped the scholar produce synthesised data, enabling the researcher to critically discuss the findings generated from the semi-structured interview sessions, interpreting and documenting the experiences and views expressed by the Khutsong township-based SMME owners.

3.7. Research Limitations, Delimitations and Feasibility.

Figure 3.4: Khutsong SMMEs Sample Population.



(Self-Created).

The purpose of Figure 3.4 above is to provide an overview of the Khutsong township-based SMMEs business sectors that participated in this study.

3.7.1. Limitations.

Initially, the study aimed to make use of 60 voluntary township SMMEs aggregated as per retail category: i) building and hardware; ii) hair and beauty salons; iii) fast food outlets and catering services; iv) spaza tuck shops; v) panel beaters; vi) childcare services; vii) backroom rentals; and viii) shebeens and taverns. Consequently, when the researcher went into the field to collect data from the proposed sectors, they discovered how the following factors affected some of the Khutsong SMME business sectors:

1. Karst sinkholes: The detrimental effects associated with the administrative decision made by the Merafong City Local Municipality supporting the Sibanye Gold Mine SLA agreement authorising the mine to dewater the dolomitic karst aquifers in the 1940s have posed geological challenges over the years, affected the infrastructure, and led to Khutsong homes being swallowed, maintains Seleka (2021:01). The Elijah Barayi Village Department of Human Settlements housing project has compensated residents who have lost their infrastructure.

However, the central issue is the amount of space allocated, as they cannot build a back-room unit to rent out nor erect a hardware infrastructure due to the requirements of the Building Extensions SANS 10400 building regulations. Consequently, this has eliminated the backroom rental SMME sector.

2. The researcher secured interview appointments with the Merafong City Local Municipality officials within the directorates mentioned above. Before acquiring a permission letter, the researcher provided them the following: 1) Wits ethics clearance certificate, 2) a letter of introduction, 3) participation consent and 4) audio recording forms, which they read and understood. Unfortunately, the executive director who was supposed to sign the permission letter has been on sabbatical due to health-related issues. The municipality needs help appointing an acting executive director in their absence due to staff shortages and fiscal constraints. It is crucial to emphasise that the notion of REI4P and its potential as a driver for Local Economic Development (LED) was entirely novel to the officials of Merafong City. They were introduced to it solely through news outlets or by reviewing neighbouring mines' mining service level agreements. Consequently, the managers overseeing various directorates: 1) Local Economic Development, 2) Finance, 3) Water and Lights, 4) SMMEs Business Development, 5) Skills Development Units, and 6) SCM were inclined to refuse to participate in my study due to their unfamiliarity with the concept.

3.7.2. *Delimitations.*

The delimitation of this study is based on the fact that the research aimed to use 60 voluntary township SMMEs aggregated as per the above-mentioned retail category. Consequently, the scholar discovered that the backroom rental and building and hardware business sectors collapsed due to many factors discussed in the limitations section. The researcher chose to replace these Khutsong SMME business sectors with the following: (i) textile and upholstery and (ii) Internet cafes, as they still met this study's sampling criteria, increasing the number of voluntary township-based SMMEs from 60 to 64, implying that each sector had to consist of 8 businesses. It is crucial to consider a fundamental discovery made by the scholar during the primary data collection process, which is as follows:

1. The global pandemic COVID-19 harsh lockdown restrictions: It is essential to highlight that the pandemic propelled most developmental states to realise their mandate of the fourth industrial revolution progressively. Consequently, to reduce the spread of the coronavirus, the South African government imposed harsh lockdown restrictions, which meant that people had limited movement. Consequently, it led to new trends in the information, communication, and technology sectors when individuals had to seek alternative means to continue surviving and being functional whilst being safe in the comfort of their homes. This trend illustrates that most individuals started investing in purchasing a home printer, which enables them to scan, photocopy, email, and fax documents at no additional cost within the comfort and safety of their homes. While job applications and lecturing were modified to be accessible on a digital platform using Microsoft Teams, Zoom, and all other communication platforms, the Internet Cafe Khutsong SMME business sector was crushed, with most of these businesses closing and only a handful remaining in operation.
2. It is essential to highlight that the researcher acquired verbal permission to interview officials and secured interview appointments with the respective municipal managers in the various directorates mentioned above. The researcher had to wait for an institutional permission letter from the acting Municipal Manager of the Merafong City Local Municipality, Ms L. Mere, to authorise engagement with local government officials as participants in this study. As she was on sabbatical due to health-related issues.
3. In response to the limitation of being unable to collect primary data through interviews with managers in critical directorates - namely, 1) LED, 2) Finance, 3) Water and Lights, 4) SMMEs Business Development, and 5) Skills Development Units and 6) SCM, as outlined in the limitations section. The researcher recognised the significance of comprehending how integrating REI4P as an LED strategy could contribute to economic and skills development within Khutsong Township and its economy. The researcher adopted an alternative approach and pivoted towards a comprehensive secondary desktop documentary analysis.

This analysis comprised municipal documents centred around LED and Township Economy, focusing on Partial Renewable Energy Integration and Procurement Practices on LED, as well as the multifaceted effects of electricity insecurity, particularly load shedding, on SMMEs and its implications for the local economy and development profile.

4. Based on Figure 3.4 above, the researcher could not meet the intended targeted sampling population of 64 voluntary township-based SMMEs besides the Internet cafe. Its limitation was expounded in number point 1 above. It is important to highlight that other Khutsong township-based SMME sectors refused to participate in the study.

3.7.3. Feasibility.

This research was undertaken in Khutsong township in the Carletonville-Merafong City local municipality, the researcher's hometown. The researcher will bear the onus of collecting, capturing, and analysing the data. Most data will be collected through desktop research, eliminating travel costs.

3.8. The Research's Ethical Consideration.

Ethics is a set of moral principles that regulate how academic researchers conduct their research. The researcher applied and acquired ethical clearance with the Wits School of Governance Non-Medical Research Ethics Committee. The research considered Braun and Clarke's (2014: 291) quality criteria associated with the constraints of academic publications established by Kitzinger and Willmott's (2002) quality criterion. Acting as a guide to develop a research participants study information sheet and consent form. To ensure that the voluntary research participants understand the nature and process of the study and to safeguard and not violate the rights of participants. Due to the intrusive nature of the primary instruments selected for data collection in this study. The participant information sheet and consent audio recording forms for the semi-structured interview highlighted the use of pseudonyms or anonymity to disguise the identification of the subject to the participant's discretion when collecting and coding the primary data. The audio recording consent forms highlighted that audio recording will have restricted access with password encryption accessible to the research supervisor and researcher.

Lastly, to ensure that the research findings reflect trustworthiness encompassing four criteria, namely, credibility, conformability, transferability, and dependability, are trustworthy and empower their audience with knowledge, this research will employ Tichapondwa (2013:212), Bryman (2014:393), and Miles, Huberman, and Saldana's (2020:304) reliability and validity measures. Therefore, to ensure that these research findings are not contested and empower their audience with knowledge, the researcher will adopt a qualitative research criterion outlined by Bryman (2021:393) and Braun and Clarke (2014:162). To ensure that their findings take into consideration the impact and importance their research will have on a community, sensitivity to the context of the research's social setting, potential ethical issues and theoretical position; and lastly, ensure that the research methods selected are transparent and coherent to the cultural, political, and social context.

3.9: CHAPTER SUMMARY.

At the phase of this chapter, it is essential to highlight that the research project has begun with its primary data collection process, implementing the proposed data collection instruments. The research project interviewed, recorded and documented all the relevant information centred around exploring the South African Renewable Energy Initiative and its potential role in Khutsong township's economic development. Using the most suitable techniques and research approaches to progressively realise the research objectives without infringing on the rights of participants aligned to Wits Non-Medical Ethical techniques. Chapter four will focus on data analysis and review, which entails presenting an analysis of the primary and secondary qualitative data collected.

Chapter 04.

Presentation of Findings and Discussions.

Exploring the REI4P Potential in Khustong's Township Economic Development: Leveraging REI4P for Inclusive Local Economic Development.

4.1. Introduction.

The preceding chapter focused on this study's research methodology to "Explore the South African Renewable Energy Programme and its Potential Role in Khutsong Township Economic Development". The study selected Khutsong township-based SMMEs based in the MCLM within the WRDM to explore whether the MCLM can leverage the REI4P as a catalyst for LED. There are limited studies on the role of the REI4P in strategically integrating informal businesses, such as Khutsong township-based SMMEs, to stimulate LED. This chapter will present and analyse data gathered from credible and reliable primary and secondary sources such as Khutsong township-based SMMEs, academic literary documents associated with renewable energy integration, LED, township economy, and SMME development.

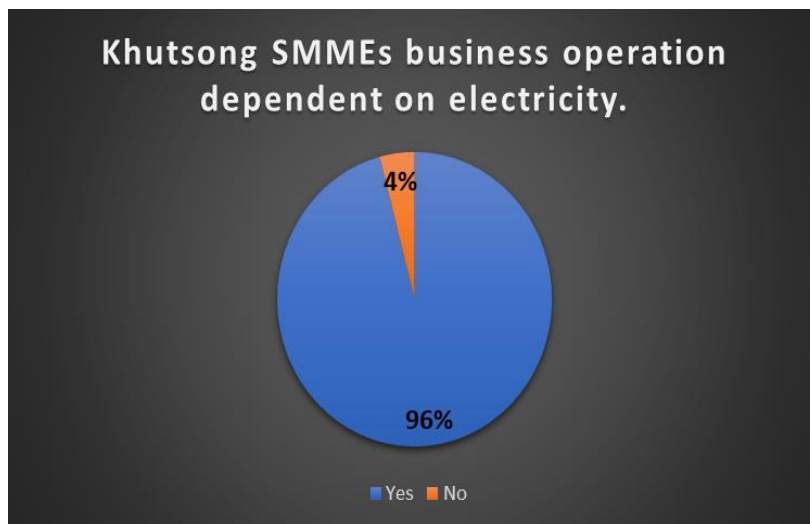
4.2. The Impact of Electricity Insecurity on Khutsong Township-based SMMEs.

4.2.1. The presentation of findings from the primary data collected in this study produced two challenges related to electricity insecurity: i) Challenges in optimising operations amidst power supply disruptions. ii) Electricity Insecurity as a barrier to the township's local economy and development. The detailed narratives inform the understanding of how electricity insecurity impacts the business operations of participants. They describe electricity insecurity as a phenomenon that affects their business operations and acts as a barrier to the local economy and the development of Khutsong township. The presentation of findings is summarised in thematic analysis tables. These include:

- i) "Table 4.1: Thematic Analysis: Electricity Insecurity on Khutsong SMMEs and Local Economy and Development."
- ii) "Table 4.8: Thematic Analysis: Potential Barriers to Renewable Energy Integration in Khutsong Township."
- iii) "Table 4.9: Thematic Analysis: Empowering Township SMMEs through Renewable Energy Education and Skill Development."

These tables aim to elucidate how the challenge of electricity insecurity serves as a barrier to the development of Khustong’s SMMEs and its local economy. Furthermore, they explore how the operationalisation of the REI4P as an LED activity can empower Khutsong SMMEs through renewable energy education and skill development programs.

Figure 4.1: Khutsong SMMEs Business Operation Reliant on Electricity Security.



(Self-Created)

Khutsong township-based SMME respondents were asked: Does the operation of business fully depend on electricity? (Yes/No)

Figure 4.1 above illustrates that electricity is the predominant energy source utilised by most commercial operations in Khutsong township. Specifically, 96% of SMMEs in Khutsong rely primarily on electricity for their operations. This figure underscores the importance of electricity security as it directly affects the ability of Khutsong SMMEs to operate effectively.

Table 4.1: Thematic Analysis: Electricity Insecurity on Khutsong SMMEs, Local Economy and Development.

Theme	Related Codes	Exemplary Statements.
1. Electricity Insecurity Challenges- Optimizing Business Operations Amidst Power Disruptions.	Operational efficiency, safety & security,	<i>In my business, the equipment, including the compressor and wheel balancing tools, faces setback when Loadshedding occurs.</i> <i>As a tavern owner, my business operates</i>

<u>Definition:</u> This theme focuses on understanding and identifying difficulties businesses face due to electricity insecurity. Thus, identify the strategic efforts businesses adopt to navigate the complexities of electricity insecurity, seeking ways to optimise their operations.	● Loss of clients and staff, impaired customer relations, ● Loss of income, unplanned & wasteful expenditure,	during peak evening hours. I have had to rent out a generator to keep my business running. However, I have been a victim of theft as generators are selling like hotcakes due to their high demand. This left me with a debt burden, and I am still paying off the owner. ● When loadshedding strikes, the business has to close, resulting in the loss of clients. With daily occurrences lasting 2-4 hours, it poses multiple risks. The company becomes vulnerable to theft as the alarm and camera systems are rendered inactive, compromising both security and client confidence. ● In my business, Loadshedding causes us to lose clients due to a breach of promise. I find it challenging to retain customers' trust because they may opt to take their business to a competitor. It seems like excuses when I explain the delays caused by the power cuts, making it difficult to convince clients that the project will be completed on time. ● It disrupts my business operations and leads to clients waiting for extended periods, resulting in dissatisfaction with our service. ● Loadshedding causes me to incur additional expenditure as I have to buy fuel like Diesel to power up the generator to keep my business running. ● loadshedding has genuinely affected my business negatively. I've had to incur unplanned expenditures purchasing a generator to keep both my tuckshop and tavern running successfully. It results in a loss of R2000 per 2 hours of loadshedding, making it challenging to gain a positive return on the investment. ● I cannot make up for any profits lost, as people prefer affordable services and I cannot increase prices due to an economic recession ● Rolling power cuts impact the way I generate profits in my business. Some parents of the learners are self-employed as SMME owners, facing similar challenges and struggling to generate profits. This difficulty makes it tough for them to pay for their children's tuition. Others, who had jobs before the COVID-19
--	--	--

	● Damaged electronic equipment and stock, ● Business Owner's Approach.	<i>lockdown, either lost their jobs or passed away, and they are still grappling with accessing employment opportunities in South Africa.</i> ● <i>Just last week I have had to replace a microwave and a kettle.</i> ● <i>I find myself having to throw out spoiled items to avoid risking customers' health with potential food poisoning. I struggle to store stock efficiently since I can't buy in bulk, which directly affects my budget. This limitation leads to a loss in profits.</i> ● <i>The impact is evident as I have had to replace two computers that were damaged during power outages.</i> ● <i>I didn't initially consider finding an alternative power source to help run my business. I've been trying to work around the unreliable schedule. Now that I've recognised Loadshedding as a national epidemic here to stay, I've started exploring alternative ways to power up my business. I recently had a meeting with a service provider offering a UPS Power inverter to keep the business running.</i> ● <i>I have had to rent out a generator to keep my business running.</i> ● <i>I'm forced to repurchase spoiled stock on credit from the butcher and fruit and veg supplier.</i> ● <i>I have been forced to use gas which slows down food preparation during loadshedding and this makes my customers impatient.</i>
2. Electricity Insecurity -A Barrier to Townships Local Economy and Development. <u>Definition:</u> This theme focuses on the adverse effects of unreliable electricity on the economic and developmental aspects of townships. This theme explores how persistent power challenges hinder	● Unreliable load-shedding schedule,	● <i>The load-shedding schedule is absolutely unreliable because it can indicate that it will occur in the morning but the power can only return in the late afternoon without an explanation.</i> ● <i>The schedule is not trustworthy as it can change at any given time and that makes it hard for me to complete and achieve my daily targets. Sometimes I have to sleep in my business to ensure that I finish the customer's</i>

local economic growth and impede local economic development within Khutsong township.	● Lack of maintenance and compensation for damages incurred, government support programs ● Slow Business operations, ● Community empowerment, local job creation & skills development	<i>designer outfit.</i> ● <i>I have no insurance nor any knowledge of the green fund and REI4P. Thus, I have never received any compensation from the government for any damages or losses incurred.</i> ● <i>I have never received any help, incentive, or compensation from the government for the losses incurred. I don't have insurance because it is expensive to maintain, given the irregular profit margin.</i> ● <i>During loadshedding customers struggle to make calls to place orders, withdraw money from ATMs or make electronic payments because the network towers lose connectivity, which causes business operations to suffer and operate at a loss.</i> ● <i>The major risks associated with Loadshedding also affect my earning patterns as I earn per output. It makes it hard for me to generate a suitable income to provide for my family, pay rent, and school fees, and cover any essential lifestyle expenditures. Consequently, I've had to change my spending patterns due to inflation affecting the cost of living and affordability.</i> ● <i>I have had to let go of some of my young staff because of the low-income generation and felt guilty that I am responsible for contributing to unemployment.</i>
--	---	--

(Self-Created)

4.2.1. Challenges of Electricity Insecurity in Optimising Khutsong Township-based SMME Business Operations.

Access to reliable and affordable electricity is considered a fundamental right in South Africa, as outlined in Section 5(1) of the National Energy Act 3 of 2008. It is widely recognised as

pivotal to the operation of most SMMEs. Table 4.1 above is a thematic analysis of electricity insecurity in Khutsong SMMEs, local economy and development.

The study discovered that an unreliable electricity supply affects Khutsong SMME business operations in several ways and is a barrier to the township's local economy and development. In this study, electricity insecurity refers to the situation where the government, a state-owned enterprise, or a local government institution such as Merafong City cannot consistently provide a reliable power supply.

It is crucial to emphasise that this study discovered how electricity insecurity poses multiple challenges that significantly impact the business operations of SMMEs in Khutsong township. The identified challenges include i) poor operational efficiency, ii) safety and security concerns, iii) loss of clients and staff, iv) impaired customer relations, v) loss of income and unplanned expenditure, and vi) damage to electronic equipment and stock. However, it is noteworthy that business owners have adopted various approaches to mitigate the effects of load shedding. The thematic analysis Table 4.1 effectively communicates and identifies these challenges stemming from electricity insecurity affecting SMMEs in Khutsong township.

Participants from various sectors included in this study highlighted that electricity insecurity significantly hampers their operational efficiency, resulting in the loss of clients. Due to the inactivity of electronic equipment, they rely on it to provide services.

However, the study revealed that electricity insecurity poses a particularly significant threat to the textile upholstery, clothing design, automobile, panel beaters, and welding business sectors. Because these sectors have explored alternative cordless equipment and discovered that it is either expensive or not widely available in the market. One participant expressed, *“In my business, equipment such as compressors and wheel balancing tools face setbacks during Loadshedding.”*

Another challenge of electricity insecurity discovered is the loss of clients, delays in production and impaired customer relations.

“In my business, loadshedding causes us to lose clients due to a breach of promise. I find it challenging to retain customers' trust because they may opt to take their business to a competitor. It seems like excuses when I explain the delays caused by the power cuts, making it difficult to convince clients that the project will be completed on time.”

The findings reveal that safety and security present a significant challenge to the business operations of Khutsong SMMEs. Participants highlighted that load shedding jeopardises the safety of both clients and employees while also exacerbating crime due to the inactivity of security measures such as alarm systems and cameras.

“As a tavern owner, my business operates during peak evening hours. I have had to rent out a generator to keep my business running. However, I have been a victim of theft as generators are selling like hotcakes due to their high demand. This left me with a debt burden, and I am still paying off the owner.”

Consequently, Khutsong SMMEs either close or delay opening their businesses during load-shedding periods to avoid becoming victims, resulting in unreliability and loss of clients and income during those hours.

Participants in the i) spaza and tuck shops, ii) Nursery or Preschools and iii) information technology and internet cafes reported that they constantly have to replace damaged equipment caused by electric surges.

“Just last week I have had to replace a microwave and a kettle.”

It was discovered that electricity insecurity disrupts business operations, increases costs, and undermines profitability for small business owners in Khutsong township. The SMME business owners, as participants, i) fast food outlets and catering service sector *“I find myself having to throw out spoiled items to avoid risking customers' health with potential food poisoning.”* and ii) Shebeen And Taverns highlighted, *“I've had to incur unplanned expenditures purchasing a generator to keep both my tuckshop and tavern running successfully. It results in a loss of R2000 per 2 hours of loadshedding, making it challenging to gain a positive return on the investment.”* electricity insecurity results in loss of income, unplanned & wasteful expenditure.

It is important to highlight that Khutsong SMMEs have adopted various alternative measures to mitigate the effects of electricity insecurity. For instance, the owner of CB Internet Cafe & Business Consultants is contemplating investing in an Uninterruptible Power Supply (UPS), a device designed to maintain power in the event of a failure. Similarly, most SMME owners in

the Fast Food and Catering services retail category have explored alternatives such as gas to sustain their operations during power outages.

Additionally, SMME owners in sectors like Spaza Tuckshop, Tavern & Shebeen, and Automobile, Panel Beating & Welding have used generators to keep their businesses running amidst power outages. The listed challenges provide a comprehensive overview of the adverse effects on business operations, financial aspects, and the overall functioning of the businesses in the area. Additionally, mentioning the business owners' approach in mitigating the effects of load shedding indicates that the study explored potential strategies or responses Khutsong SMMEs adapted to address these challenges.

4.2.2. Challenges of Electricity on Khutsong Townships' Local Economy and Development.

The key findings emerging from the theme 'Challenges of Electricity Insecurity in Optimizing Khutsong Township-based SMMEs Business Operations' are closely linked to the second theme 'Electricity Insecurity - A Barrier on Townships' Local Economy and Development.' Therefore, it can be conceptualised and understood as an experience of the impact the South African national service delivery crisis - electricity insecurity - has on Khutsong SMMEs. The second theme discovered that the challenges of electricity insecurity in optimising Khutsong Township-based SMME business operations are a significant obstacle.

The insight shared by the participants illustrates how electricity insecurity can act as a barrier to Khutsong's Township-based SMME development and the local economy. The study participants reported that during loadshedding, business is slow, and customers struggle to make calls to place orders, withdraw money from ATMs or make electronic payments.

“During loadshedding, customers struggle to make calls to place orders, withdraw money from ATMs or make electronic payments because the network towers lose connectivity, which causes business operations to suffer and operate at a loss.”

The network towers lose connectivity, causing business operations to suffer and operate at a loss. Security gets compromised due to systems shutting down and being unable to operate at an optimal level, causing businesses to be prone and vulnerable to theft. This challenge has severely impacted the Fast Food & Catering Services, Beauty & Hair Salons, Spaza, Tuck Shops, and Tavern & Shebeen SMME sectors in Khutsong.

Consequently, all the SMMEs in Khutsong end up paying for operational expenditures to install additional security measures, forfeit potential revenue to acquire alternative power supplies during load shedding and pay for the repairs or replacements of damaged electronic equipment caused by electric surges. It was discovered that some SMMEs had to lay off their employees.

“I have had to let go of some of my young staff because of the low-income generation and felt guilty that I am responsible for contributing to unemployment.”

Meanwhile, others' wages were reduced, making it hard to sustain their basic lifestyle of providing for their family, paying rent, and paying school fees.

“The major risks associated with Loadshedding also affect my earning patterns as I earn per output. It makes it hard for me to generate a suitable income to provide for my family, pay rent and school fees, and cover any essential lifestyle expenditures. Consequently, I've had to change my spending patterns due to inflation affecting the cost of living and affordability.”

These findings demonstrate that electricity insecurity hinders community empowerment, local job creation and skills development. It was discovered that power interruptions affect the production process because operating machines or equipment are interrupted midway, resulting in waste and wasted costs. They also cause businesses to be less profitable.

Electricity insecurity is forcing Khutsong SMMEs to reprioritise their financial budgets to accommodate the grotesque effects of power cuts. This challenge mainly affects the automobile, panel beating and welding, and textile and clothing industry SMME sectors. Consequently, some of the Khutsong SMMEs opted to inflate product prices to maintain their profit margins, while consumers suffered the consequences of the extra costs and rolling power outages. It is essential to highlight that the study discovered that challenges of electricity insecurity, such as unreliable load-shedding schedule, lack of maintenance and compensation for damages incurred, government support programs, community empowerment, local job creation and skills development, are currently hindering Khutsong Township's Local Economy and Development.

The summary of findings is presented in Table 4.1, surrounding the theme 'Barriers of Electricity Insecurity on Townships Local Economy and Development.' Demonstrates that

these need to be addressed and will require a combination of infrastructure improvements, government policies, adaptive public-private partnerships, and strategic collaboration.

To ensure a resilient LED initiative aimed at improving the local economy of Khutsong and developing its local businesses. The next section examines whether the Merafong City Municipality can leverage the REI4P as a catalyst for LED.

4.3. Exploring the Merafong City Leveraging the REI4P as a Catalyst for LED: Empowering Khutsong Township SMMEs.

This section will delve into the intricate nuances of this transformative initiative, where the sub-heading, titled "Exploring the REI4P Potential in Khutsong's Township Economic Development: Leveraging REI4P for Inclusive Local Economic Development," will unveil a comprehensive examination of how the Merafong City can leverage the REI4P as a catalyst for LED. Aimed at exploring how the Merafong City Local Municipality can strategically integrate Khutsong SMMEs into the REI4P as an attempt to mitigate the effects electricity insecurity has on their business operation.

4.3.1 The Role of Merafong City Local Government in leveraging the REI4P as a catalyst for LED.

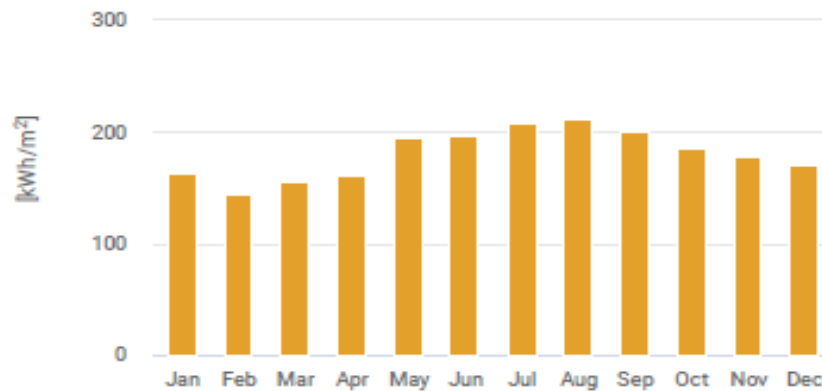
There are two approaches which the Merafong City local municipality can adopt to leverage the REI4P as a stimulus for LED. The first approach involves the municipality as an Independent Power Producer. The second approach involves the municipality identifying private companies to sub-contract Khutsong SMMEs as Small-Scale Energy Embedded Generators (SSEEG). Both these approaches require the Merafong City Local Municipality to have substantial amounts of renewable energy that can be harnessed. Therefore, it may involve conducting feasibility studies to identify suitable locations, assessing the renewable energy potential, and understanding the technical and economic viability of the project.

4.3.2. Examining Merafong City's Rooftop Solar Radiation.

Figure 4.2: The Merafong City Local Municipality Direct Normal Irradiation (DNI).

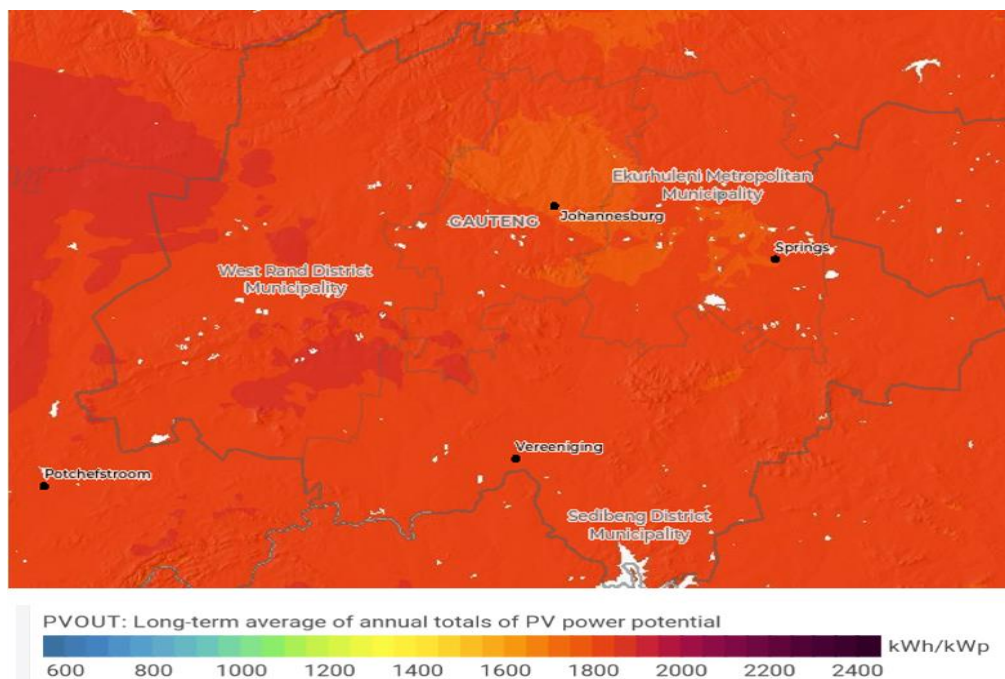
Monthly averages

Direct normal irradiation



Source: World Bank Group (2022). Merafong City Local Municipality PV Electricity and Solar Radiation Report.

Figure 4.3: The Gauteng Province and West Rand District Municipality Solar Radiation Map.



Source: World Bank Group (2022) Merafong City Local Municipality PV Electricity and Solar Radiation Report.

The purpose of Figures 4.2 and 4.3 above is to illustrate the potential for photovoltaic power generation within the West Rand District Municipality. The Gauteng Province comprises three municipal districts: the Ekurhuleni Metropolitan Municipality, the West Rand Municipality,

and the Sedibeng District Municipality. According to the World Bank Group (2022), the Gauteng Province solar radiation map data indicated that the West Rand District Municipality, which comprises the MCLM, has an 1871.5 kWh/wp specific photovoltaic power output, with Direct Normal Radiation (DNI) worth 2497 kWh/m². The mean calculation method was adopted using the formula to calculate the annual DNI average the Merafong City area can generate. The calculation is as follows:

$$= \frac{180 + 150 + 160 + 170 + 198 + 199 + 201 + 205 + 200 + 280 + 278 + 276}{12} = 2497 \text{ kWh/m annually which suggests a relatively high efficiency for rooftop solar panel systems.}$$

This finding demonstrates that Merafong City has the potential to leverage the REI4P as a catalyst for LED.

In the context of this research, the Merafong City municipality would have to adopt measures that will encourage the use of solar renewable energy and initiatives for climate change adaptation and mitigation. Subsequently, the MCLM must establish a Local Government Renewable Energy Efficiency Strategy. Establishing a renewable energy strategy will enable the municipality to strategically integrate Khutsong township-based SMMEs to participate and partner in the emerging renewable energy market. Based on the two approaches, the Merafong City local municipality can adopt to leverage the REI4P as a stimulus for LED identified above. The municipality must undertake the following measures:

4.3.4. Amend the Merafong City Local Municipality Integrated Development Plan (IDP).

According to Roberts and Mahlangu (2018:03), local government can significantly contribute to the national mandate of the South African government's response to climate change. Municipalities have been granted legislative authority, which enables them to carry out their mandate to provide essential public services to communities within their jurisdiction in a way that will result in a climate-resilient community that engages in energy management. It would require the local government and public service institutions such as Merafong City to embrace sustainable and climate change projects.

That can create jobs and enhance the quality of life for those affected by electricity insecurity for SMMEs in Khutsong Township to increase municipal revenue. Roberts and Mahlangu

(2018:04) assert that local government should realise its potential role in the South African government's national mandate to respond to climate change. Multiple interested municipalities would need to reconstruct the most crucial planning document and a socio-economic framework. Regarding the municipalities' land use, environmental protection, and infrastructure development. While also assisting municipalities in identifying development opportunities, priorities, and resources these projects require, known as the IDP.

According to the South African Local Government Association Energy Policy and Legislation Guide Electricity and Energy Councillor Induction Programme (2017:20) and Roberts and Mahlangu (2018:06), The MCLM must reconstruct its long-term IDP vision. To ensure that its economic and environmental priority areas consider the role and use of rooftop solar PV renewable energy. In the case of this study, this entails that Merafong City will need to undertake an electricity insecurity impact assessment and conduct a solar PV renewable energy feasibility study. The assessment and feasibility study findings will enable the municipality to identify the impact electricity insecurity has on local economic development. Merafong City's local municipality must amend its IDP at the beginning of the five-year election term to be reviewed annually.

The IDP amendment would have to incorporate and coordinate measures to encourage the use of solar renewable energy as a climate change adaptation and mitigation initiative at local government. Firstly, the amendment requires adding climate change, energy efficiency, and renewable energy as regional priority areas. To help the municipality plan for energy-related functions and provide reliable and affordable electricity. The second amendment involves amending the environmental analysis section in the draft 2022 IDP to align with the national and provincial renewable energy policy framework planning requirements. These amendments will enable the municipality to determine whether the municipality has the capacity and resources to leverage the REI4P as an LED initiative.

4.3.5. Craft a Climate Change & Renewable Energy Efficiency Strategy.

The MCLM will need to create a Local Renewable Energy Efficiency Strategy as part of its voluntary commitment to leveraging the REI4P as a catalyst for LED.

Strategically integrating Khutsong SMMEs as the main beneficiaries into a complex monopoly of renewable energy could help them mitigate the effects of electricity insecurity on their

business operations, among other LED opportunities. It is important to highlight that leveraging the REI4P as a stimulus for LED in Merafong City can help the South African government progressively achieve its 2030 net-zero carbon emission goal.

The purpose of presenting and analysing the Local Renewable Energy Efficiency Strategic municipal objectives in tables 4.2 - 4.7 below underscores the importance of effective stakeholder management in achieving sustainable energy outcomes. By actively forging partnerships with key stakeholders ranging from government agencies to financial institutions, international donors, and local government associations, the MCLM can capitalise on diverse funding mechanisms to realise its Local Renewable Energy Development objectives. The Local Renewable Energy Efficiency Strategy must outline the budget and clearly state the roles, responsibilities, and activities that key and passive stakeholders must undertake.

In order for Merafong City to operationalise the integration of the REI4P as an LED activity. Its Local Renewable Energy Efficiency Strategy needs to comprise the following municipal tactical objectives in tables 4.2 - 4.7 below.

Table 4.2: The Merafong City Local Municipality Climate Change & Renewable Energy Efficiency Strategy Tactical Objective Number 1: Renewable Energy Development.

1. Renewable Energy Development.	
Municipal Actions Realising the Objective.	Potential Stakeholders to Fund the Objective.
The Merafong City Local Municipality (MCLM) will need to promote the installation of rooftop solar PV SSEG for the numerous Khutsong township-based business sectors. This will require the municipality to institutionalise and tailor the SSEG procedure to ensure it is suitable for local government operations. This would entail that the municipality must communicate the requirements and regulations that	According to stakeholder management theory, Merafong City must engage various stakeholders to effectively realize its strategic objective of Renewable Energy Development within the local sphere of government. As advocated by the South African Local Government Association Energy Efficiency and Renewable Energy Strategy Guide (2021:56). One crucial

Khutsong township-based SMMEs must comply with and register to install solar panels on the SSEG database.

According to the guidelines outlined in the South African Local Government Association Energy Efficiency and Renewable Energy Strategy Guide (2021:57), the MCLM would also need to revise their current electricity metering and billing systems to accommodate a bi-directional flow of solar electricity. NERSA will play a significant role in setting appropriate tariff charges. Since the municipality has resorted to implementing load reduction as a strategic intervention to recover municipal debt, acquired through a culture of non-payment, illegal connections, and metre bypassing. The installation of solar panels will create an opportunity for the municipality to recover its debt by conducting a cost-reflective tariff system that will enable SSEGs, which are Khutsong township-based SMMEs in this case, to pay their debts. In order to achieve the action mentioned above, the municipality will need to develop a municipal a Renewable Energy SSEEG Solar PV procurement program.

aspect involves exploring diverse funding mechanisms to support their local energy governance initiatives. These mechanisms include

1. DMRE EEDSM: Collaboration with the Department of Mineral Resources and Energy's Energy Efficiency Demand Side Management (EEDSM) program can provide financial support and technical expertise to advance renewable energy projects.
2. The Development Bank of South Africa's Embedded Generation Investment Programme (EGIB): Partnering with the Development Bank of South Africa can offer funding opportunities and help facilitate the implementation of r Solar PV SSEEG projects at local government.
3. Engaging with international donor funding organizations such as Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), the South African German Energy Programme (SAGEN), International Finance Corporation (IFC), and United Kingdom Partnering for Accelerated Climate Transition (UK PACT) can unlock financial resources and knowledge exchange opportunities to support Renewable Energy Development projects within the municipality.
4. SALGA (South African Local Government Association): Collaboration with SALGA will enable the municipality

	to access resources, and networking opportunities. Fostering collective action and knowledge-sharing to advance the renewable energy agendas at the grassroots level.
--	---

Self-Created

Table 4.3: The Merafong City Local Municipality Climate Change & Renewable Energy Efficiency Strategy Tactical Objective Number 2: Local Energy Governance.

2. Local Energy Governance.	
Municipal Actions Realising the Objective.	Potential Stakeholders to Fund the Objective.
The institutionalisation of the renewable energy mandate to combat climate change at the local government level requires a concerted effort involving various stakeholders. The South African Local Government Association Energy Efficiency and Renewable Energy Strategy Guide (2021:28) emphasises the need for Merafong City to establish a sustainable energy cross-sector, which serves as a platform for collaboration among different departments and stakeholders. This cross-sectoral approach involves coordinating efforts across departments to identify and address the functional needs of the municipality in implementing renewable energy by leveraging existing initiatives and resources, such as township infrastructure revitalisation projects. The municipality can integrate renewable energy planning into its overall strategy. The integration will align with broader goals, such as housing delivery and local government infrastructure programs while promoting renewable energy awareness.	To effectively realise their energy efficiency and sustainable development mandate in combating climate change. The Merafong City municipality should explore various funding mechanisms. To support their local energy governance strategic objective as outlined in the South African Local Government Association Energy Efficiency and Renewable Energy Strategy Guide (2021:27): 1. MCLM Budget Operating Capital Expenditure: Utilizing the municipality's budgetary resources to allocate funds

Prioritising the integration of renewable energy solutions, such as rooftop solar PV energy, into its infrastructure projects will contribute to energy efficiency. Thus, help combat climate change at the local level. Additionally, by addressing energy insecurity, particularly in areas like Khutsong township, the municipality can support local SMMEs and mitigate the adverse effects on their operations.	specifically for energy efficiency and sustainable development initiatives. 2. Municipal Infrastructure Grant: Leveraging grants allocated for municipal infrastructure projects to invest in renewable energy infrastructure and other sustainable development projects. 3. EEDSM Grant: Accessing grants provided through the Energy Efficiency Demand Side Management (EEDSM) program to implement energy efficiency measures and promote sustainable energy practices within the municipality.
---	---

Self-Created

Table 4.4: The Merafong City Local Municipality Climate Change & Renewable Energy Efficiency Strategy Tactical Objective Number 3: Electricity service and Business Model.

3. Electricity Service and Business Model.	
Municipal Actions Realising the Objective.	Potential Stakeholders to Fund the Objective.
The South African Local Government Association Energy Efficiency and Renewable Energy Strategy Guide (2021:66,67 & 68) provides a comprehensive framework that municipalities like Merafong City can adopt. To navigate	For the MCLM to progressively realise its energy efficiency and

integrating renewable energy and energy efficiency initiatives within local government. The guide outlines that municipal distributors are crucial in providing sustainable electrical services within their jurisdictions. Given the local government's fiscal structure, many municipalities rely heavily on revenue generated from power sales to fulfil their financial obligations for service delivery. It is imperative to recognise that the municipality's ability to increase revenue is closely tied to its electricity distribution practices. Underscores the significance of effectively managing stakeholders involved in the electricity distribution process. By aligning distribution strategies with the principles outlined in the energy efficiency and renewable energy strategy guide, Merafong City can optimise revenue generation while simultaneously advancing its sustainability objectives. Given that the MCLM is in a grotesque and unsustainable fiscal position, it would need to develop sustainable revenue models and identify alternative revenue streams. Therefore, to operationalise the REI4P within their municipality. Merafong City needs to undertake a cost-of-supply study and a cost-informed tariff development. Ascertaining the costs associated with the grid and energy from the independent energy industry as new revenue sources will help the municipality develop an appropriate and sustainable tariff system and revenue model. The restructured business model will help the MCLM facilitate the adoption of SSEG, preserving the integrity of its electricity distribution model. The new business model will enable the municipality to introduce innovative technology in township business areas. Therefore, this priority area will help the local government develop the necessary guidelines for smart	sustainable development mandate in combating climate change. It is crucial to consider various funding mechanisms and engage with relevant stakeholders to reshape its current electricity service and business model. The South African Local Government Association Energy Efficiency and the Renewable Energy Strategy Guide (2021:65) suggests exploring the following avenues: 1. The Development Bank of Southern Africa (DBSA) administers the European Union's Infrastructure Investment Programme, offering €100 million to support sustainable development initiatives. 2. GIZ, operating through various channels such as the CSIR and SEA, assists municipalities in developing sustainable electricity businesses by supporting COS studies and capacity-building activities. 3. Private companies involved in the Renewable Energy Independent Power Producer
--	---

technology, implementing an innovative metre pilot program. It is essential to highlight that the introduction of leveraging the REI4P as a stimulus for LED will help the municipality protect its revenue. The initiative will introduce a roof-mounted solar PV system for SSEG. That can serve as a program to help identify and reduce electricity theft, load reduction, and power cuts. By procuring electricity from Kutosng township-based SMMEs as rooftop solar PV SSEG.	Procurement (REI4P) Solar PV tender are required to subcontract a portion valued at 25% of the tender value with the approval of the state organ, following the Preferential Procurement Policy Framework Act (PPPFA) 2000: Preferential Procurement Regulation, 2017. 4. Municipal revenue streams can also be leveraged to fund energy efficiency and renewable energy projects.
---	--

Self-Created

Table 4.5: The Merafong City Local Municipality Climate Change & Renewable Energy Efficiency Strategy Tactical Objective Number 4: Municipal Own Energy Efficiency.

4. Municipal Own Energy Efficiency.	
Municipal Actions Realising the Objective.	Potential Stakeholders to Fund the Objective.
To manage electricity consumption in township-based SMMEs, which often are classified between the commercial and residential categories. Installing rooftop solar PV panels can help reduce on-grid consumption simultaneously, promoting energy efficiency and mitigating the grotesque effects of electricity insecurity on Khutsong township-based SMMEs. The operationalisation of the REI4P as a catalyst for LED within	The MCLM can explore and request funds from various funding mechanisms to finance its municipal energy efficiency objectives, as outlined in the South African Local Government Association Energy Efficiency and Renewable

MCLM can yield several benefits such as a) reducing maintenance costs associated with illegal connections, b) enhancing energy security by integrating renewable energy technologies, c) contributing to carbon emission reduction and d) foster the creation of green energy jobs. According to guidelines from the South African Local Government Association Energy Efficiency and Renewable Energy Strategy Guide (2021:37). MCLM will need to implement a Municipal Energy Management System (MEMS), to monitor renewable energy usage effectively. This system will aid Merafong City in planning, monitoring, and evaluating the impacts of energy optimisation, promoting energy efficiency and cost savings. Following the installation of rooftop solar panels on Khutsong SMMEs infrastructure. The municipality must install new meters to accurately record and monitor consumption and additional energy, mitigating the risk of reverse feeding. This strategic decision integrates green principles into the REI4P procurement process and raises awareness about electricity conservation.	Energy Strategy Guide (2021:36). These mechanisms include: 1. The Department of Mineral Resources and Energy's Municipal Energy Efficiency Demand Side Management (EEDSM) programme, which offers financial support and resources to municipalities for energy efficiency initiatives. 2. Municipal Infrastructure Budget provides funding specifically allocated for municipal infrastructure projects, including those to enhance energy efficiency. 3. Urban Settlements Development Grant, offering financial assistance to municipalities to develop urban settlements, which can include energy efficiency improvements. 4. Integrated City Development Grant, which supports integrated development initiatives in cities, including energy efficiency and renewable energy projects. 5. Department of Public Works and Infrastructure Programme for Khutsong Beehives, focusing on government-owned buildings in Khutsong for energy
---	---

	efficiency improvements. Engaging with these funding mechanisms allows the municipality to access resources and support from key stakeholders, facilitating realising its municipal energy efficiency goals.
--	--

Self-Created

Table 4.6: The Merafong City Local Municipality Climate Change & Renewable Energy Efficiency Strategy Tactical Objective Number 5: Energy Efficiency in the Residential & Commercial Sector.

5. Energy Efficiency in the Residential & Commercial Sector.	
Municipal Actions Realising the Objective.	Potential Stakeholders to Fund the Objective.
The MCLM will need to act by encouraging and enforcing energy efficiency through existing infrastructure development, as highlighted by the South African Local Government Association Energy Efficiency and Renewable Energy Strategy Guide (2021:52). This involves implementing and developing green building best practices for rooftop solar PV panels on the Khustong's township-based business infrastructure. To promote renewable energy efficiency localisation, which will encourage Khutsong SMMEs to explore alternative power sources for operating their businesses beyond fuels such as gas and petrol. The solar electricity generated will help these businesses power up their equipment, such as fridges, to avoid spoilage of stock or	The South African Local Government Association Energy Efficiency and Renewable Energy Strategy Guide (2021:49) emphasizes the importance of engaging relevant stakeholders to achieve energy efficiency and renewable energy goals. The MCLM can actively explore and seek funds from specific funding mechanisms, such as: 1. The Green Energy Efficiency Fund. By proactively involving

loss of customers due to electricity insecurity and load reduction.	stakeholders like the Green Energy Efficiency Fund, the MCLM will demonstrate a commitment to leveraging external resources and partnerships to advance its energy objectives. This approach will foster collaboration, encourage shared responsibility, and increase the likelihood of successfully implementing renewable energy efficiency for the commercial Sector.
---	--

Self-Created

Table 4.7: *The Merafong City Local Municipality Climate Change & Renewable Energy Efficiency Strategy Tactical Objective Number 6: Energy Access for all.*

6. Energy Access for all.	
Municipal Actions Realising the Objective.	Funding the Objective.
According to the South African Local Government Association Energy Efficiency and Renewable Energy Strategy Guide (2021:45). The South African government has introduced Free Basic Electricity (FBE) to subsidise electricity consumption for indigent low-income households. The subsidy is deemed ineffective due to illegal connections and metre tampering. The FBE-subsidised electricity fails to reach the intended users. Consequently, this outcome negatively impacts municipal revenue and creates a deficit as it is funded through cross-subsidisation for higher-end users, whether residential or commercial. For the MCLM to ensure that Khutsong township-	The South African Local Government Association Energy Efficiency and Renewable Energy Strategy Guide (2021:43) highlights the importance of engaging with various stakeholders to realise energy efficiency and renewable energy and energy access for all. To achieve this, the MCLM can explore and request funds from

based SMMEs have access to reliable and affordable energy, The municipality will need to expand and shift its electrification program to rooftop solar panel installations, prioritising Khutsong SMMEs. Therefore, Merafong City will have to identify, and implement appropriate metering arrangements to cut back on excessive on-selling fees. Considering a solar energy metering system that will improve the indigent registry process and monitor the subsidy targeting will give effect to an appropriate tariff regime being in place.	diverse funding mechanisms, including: 1. Equitable Share Grant: Collaborating with government agencies to secure funding allocations to promote energy efficiency and renewable energy initiatives. 2. Integrated National Electrification Programme (INEP): Engaging with national electrification programs to access financial resources dedicated to expanding access to electricity through sustainable means. 3. Free Basic Alternative Energy (FBAE): Leveraging initiatives to provide basic energy services to vulnerable communities through renewable energy sources, fostering inclusivity and sustainability. 4. Donor funding: Establishing partnerships with donor organizations to secure financial support for energy efficiency and renewable energy projects, ensuring alignment with broader development objectives.
---	--

Self-Created

It is crucial to emphasise that the successful implementation of the measures mentioned above of a) amending the Merafong City Local Municipality Integrated Development Plan and b) the Merafong City Local Municipality crafting a Climate Change & Renewable Energy Efficiency Strategy can foster a robust collaboration among diverse stakeholders. The stakeholders encompass but is not limited to: i) Khutsong SMME business owners, public-private partnerships, and renewable energy experts, enabling Merafong City to leverage the REI4P to stimulate LED. The collaboration will enable the municipality to act as an IPP by identifying neighbouring private sector companies to enter into a subcontracting arrangement with Khutsong township-based SMMEs. Valued at a minimum of 25% of the state contract value as outlined in section 12(3), which is supported by section 12 (1) stipulating that a person awarded a tender may enter into a subcontracting agreement with the approval of the organ of state supported by section 12 (1) according to the Preferential Procurement Policy Framework Act (PPPFA) 2000: Preferential Procurement Regulation, 2017.

The public-private partnership will empower Khutsong township-based SMMEs as Exempted Micro Enterprises (EMEs), to partner and participate in the REI4P as Renewable Solar Small Scale Energy Embedded Generator (SSEEG). Generating electricity to mitigate the adverse effects of electricity insecurity on their business operation and selling additional electricity back to the grid. To generate additional income or help them overcome their historical electricity rates and service debts. Additionally, ongoing monitoring and evaluation of the initiatives would be essential to ensure effectiveness and adjust as needed. Regular assessments will enable the identification of successes, challenges, and areas for improvement. This adaptive approach will ensure that the collaborative efforts remain aligned with the intended goals and can be adjusted as needed.

4.4. Contextualizing Merafong City 's Economic Development Profile and Potential Barriers of Renewable Energy Integration.

4.4.1. Merafong City 's Economic and Development Profile Contextualizing Khutsong Township.

It was discovered that the Merafong City municipality's economic and labour landscape comprising of Khutsong township is captured in a mining-centric economy. Due to the limited efforts of Merafong City to diversify its economic activities beyond mining. Consequently, this has resulted in a high migration trend of 23,545 people of its population since 2016.

Consequently, this led to people to migrate and seek employment beyond the oversaturated mining industrial activities available within the municipal jurisdiction. The unsustainable mining economy also fosters the out-migration drive. Due to the following reasons: i) commodity price and exchange fluctuations often lead to a decline in profit margins, causing mines to downsize and resulting in seasonal unemployment and job losses. ii) The over-dependence on mining poses a significant risk to the area, as local mines are projected to reach the end of their operational lifespan within the next decade, potentially transforming the township into a ghost town, Merafong Local Municipality's Draft Integrated Development Plan (2022:25). It was also discovered that the Merafong City's educational profile needs improvement, with only 9.35% of the population holding tertiary qualifications. In comparison, 28% have completed matric, and 58% have not finished their secondary education. Consequently, the statistical analysis of Merafong's educational landscape indicates a potential shortage of highly qualified and skilled individuals, estimated at 16%, with 60% of the semi-skilled population engaged in the formal employment sector.

The research findings elucidated within this study unveil a pronounced influence of electricity insecurity upon the local economy of Merafong City, evident within the confines of Khutsong township. Within this context Khutsong SMMEs are confronted by a plethora of challenges, encompassing diminished operational efficiency, heightened safety concerns, loss of both clients and staff, impaired customer relations, income reduction, unexpected expenditures, and damage to equipment and inventory. These findings emphasize the critical role that electricity insecurity plays as a barrier to the optimization of SMMEs' business operations within Khutsong township. Moreover, these findings highlight the interconnectedness between the identified theme of electricity insecurity and the broader issue which impedes the realization of sustainable economic growth and development within Merafong City.

4.4.2. An analysis of Potential Barriers of Renewable Energy Integration in Merafong City.

Table 4.8: Thematic Analysis: Potential Barriers to Renewable Energy Integration in Khutsong Township.

Theme	Related Codes	Exemplary Statements.
Barriers to Renewable Energy Integration in Township Sustainable Business Growth. <u>Definition:</u> This theme examines financial and regulatory barriers as potential factors that could hinder the interest of township businesses from seamlessly being integrated into the REI4P as a catalyst for LED in Merafong City.	• Lack of Knowledge, Awareness, & trust in government • Renewable energy-specific financial Concerns & Revenue Generation,	• <i>I want to emphasise that I have no interest in being subcontracted by the government as an SSEEG Solar PV IPP. The government has disappointed me on multiple occasions, especially the local government when it comes to SMME applications. I find it hard to believe that the rollout of this project will be any different, particularly concerning electricity.</i> • <i>The major factor most likely to prevent me from being subcontracted as an IPP would be having to rely on local government to successfully implement the project. I've lost trust in the government and would rather take the risk of installing it using my own finances. The government can always change the terms of the contractual agreement, leaving me liable for serious debt. Even though it sounds promising, I believe I'm bound to be disappointed because the government is greedy and does not serve the interests of the people it governs. I'm likely to be the last on the list and not necessarily a priority.</i> • <i>I refuse to enter any contractual agreement with the government to be subcontracted.</i> • <i>A factor I that can make me not want to get participate in the REI4P is municipality, acting as a middleman, will deduct a certain percentage. This means that my business may not necessarily reap the full benefits of selling the additional solar power generated in exchange for cash to boost profit margins.</i> • <i>I maintain that the business in Khutsong township is extremely slow. Selling electricity feels similar to selling airtime as an individual,</i>

		<i>not directly from the company.</i> ● <i>I would rather make use of my profits to invest in buying myself a solar panel.</i> ● <i>I aim to generate additional revenue from selling additional solar energy to boost my business profits.</i> ● <i>I aim to generate additional revenue and minimize the loss of clientele aimed at sustaining my business operations without any interruption.</i>
--	--	--

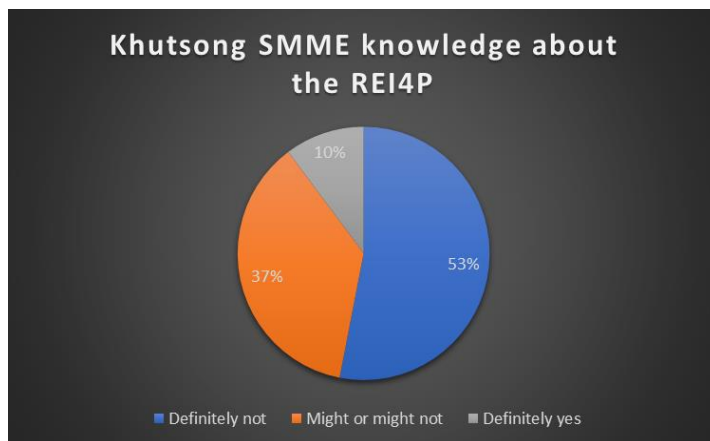
(Self-Created)

The thematic analysis table 4.8, titled "Potential Barriers to Renewable Energy Integration in Khutsong Township," sheds light on significant findings regarding Khutsong township-based SMMEs' perspectives on their integration as Solar PV SSEEGs into the operationalisation of the REI4P as a catalyst for LED. The study uncovered two primary concerns among Khutsong SMMEs: i) renewable energy-specific financial concerns and ii) lack of trust in the government's involvement in the REI4P. One participant expressed scepticism, stating,

“I want to emphasise that I have no interest in being subcontracted by the government as an SSEEG Solar PV IPP. The government has disappointed me on multiple occasions, especially the local government when it comes to SMME applications. I find it hard to believe that the rollout of this project will be any different, particularly concerning electricity.”

This sentiment reflects broader distrust in the government's ability to facilitate effective partnerships with SMMEs in renewable energy ventures. This finding underscores the significance of addressing these trust issues and financial concerns to facilitate the seamless integration of township businesses into the REI4P. Failure to do so could potentially hinder their participation and limit the success of renewable energy initiatives in Khutsong Township. Therefore, Merafong City must consider these factors when developing its local renewable energy efficiency strategy, ensuring that it addresses the needs and concerns of SMMEs and fosters trust and collaboration between stakeholders.

Figure 4.4: Khutsong SMMEs' awareness and knowledge about the REI4P.



(Self-Created)

Khutsong township-based SMME respondents were asked: Do you have any knowledge about the REIPPPP implementation strategy? (Definitely not, Might or might not, Definitely yes).

The key findings regarding the lack of knowledge and awareness, renewable energy-specific financial concerns, and revenue generation are illustrated in Figure 4.4. 53% of the participants have heard about the REI4P through the news. However, a significant portion does not fully understand its implementation, beneficiaries, and potential impact on business owners' livelihoods. Specifically, 37% of SMME owners mentioned they may have heard about the REI4P, while 10% admitted they had no prior knowledge and gained insight for the first time through this study. These findings underscore the insufficient knowledge about renewable energy integration among Khutsong township-based SMMEs. The study also uncovered that Merafong City needs to enhance its service delivery to rebuild trust. Khutsong SMME owners expressed dissatisfaction with essential service provision and a lack of trust in the government, citing unfulfilled political campaign promises. Consequently, they fear potential betrayal by the government in partnership agreements, as articulated by Tampe Trading Fast Food SMME owner:

“This municipality, Merafong, has a history of corruption. They might change the terms of agreement without my knowledge, inflate prices, or deduct money, claiming they sponsored my tuition for solar maintenance skills.”

The factors highlighted in Table 4.8, namely lack of knowledge and awareness, lack of trust, dissatisfaction with government service delivery, renewable energy-specific financial concerns, and revenue generation, were identified as barriers that could impede the interest of

Khutsong township SMMEs in seamlessly integrating into the REI4P as a catalyst for LED in Merafong City.

The MCLM audit performance was identified as another potential barrier for Renewable Energy Integration and sustainable township business growth: Given the Auditor General's findings documented by the International Standards for Auditing (ISAs) for the Gauteng provincial legislature, Merafong City's Local Municipality faces a significant barrier to Renewable Energy Integration in Township Sustainable Business Growth. Despite the municipality's financial statements meeting critical legislative frameworks, including the Municipal Finance Management Act (MFMA No. 56 of 2003), Division of Revenue Act (DORA No. 16 of 2019), and the South African Standards of Generally Accounting Practice (GRAP).

According to Cillers (2022:01), there are a set of persistent challenges identified: The municipality exhibited poor expenditure management, with a consumer debtors balance of 78.5%, mainly stemming from material losses in electricity amounting to R 150,167,272 during the 2019/20 financial year Maluleke (2020:1-8). These losses, attributed to faulty meters and non-technical losses, impeded the timely receipt of owed funds, highlighting a significant financial constraint that could impede investments in Renewable Energy Integration initiatives crucial for Township Sustainable Business Growth (Maluleke, 2020:1-8). Moreover, the Auditor General's discovery of inadequacies in financial statements, irregular expenditure, and deficiencies in compliance monitoring further underscores the challenges faced by Merafong City, potentially hindering the effective implementation of Renewable Energy Integration strategies essential for sustainable business growth in townships (Maluleke, 2020:1-8; Louw, 2023:01; Cillers, 2022:01).

4.5. Key Legislative Frameworks that can operationalise the REI4P as an LED Initiative.

In this section, the presentation of findings and discussion will revolve around exploring key legislative frameworks. That can significantly guide Merafong City towards operationalising the REI4P as a catalyst for LED. To effectively integrate Khutsong Township-based SMMEs. The absence of a clear framework to inform the integration of informal township-based SMMEs, such as those in Khutsong, could hinder the Merafong City municipality from successfully implementing the REI4P. To stimulate and develop the local economy of Khutsong township. This section identifies and assesses existing regulatory and policy frameworks that Merafong City can leverage. To inform and guide the formulation of a strategic regulatory framework to help operationalise the REI4P as a catalyst for LED.

4.5.2. Leveraging Existing Legislative Foundations to Drive REI4P as a Catalyst for Local Economic Development.

The set of frameworks discussed below was selected because they provide guidelines for integrating renewable energy initiatives into the local economy. Moreover, these key legislative frameworks can enable Merafong City to leverage them to craft a well-informed Local Climate Change and Renewable Energy Efficiency Strategic Framework. That can guide the operationalisation of the REI4P at local government and facilitate it as an LED initiative. Simultaneously, this enables Merafong City to integrate Khutsong township-based SMME development strategically. Partnering and participating in the REI4P as rooftop solar SSEEGs will help improve Khutsong's local economy.

4.5.2.1. The Integrated Resource Plan, 2003.

The Integrated Energy Plan (IEP) of 2003 emerges as a robust and comprehensive framework that Merafong City can strategically leverage to operationalise the REI4P initiative, acting as a catalyst for LED. According to the South African Local Government Association Legislation and Policy Guide (2017:12), this long-term, multi-faceted energy framework was designed to ensure i) power supply security, ii) minimise negative environmental impacts of using coal to generate electricity aimed at reducing South Africa's CO₂ emissions by 42% by 2025, iii) operationalise the use of renewable energy and diversify power-producing resources, iv) promote energy efficiency, and v) enhance electricity access.

This study discovered that municipalities, including Merafong City, can prioritise renewable energy electrification in their Integrated Development Plans (IDPs) and LED initiatives. This can be achieved by incorporating free basic alternative energy, supported by implementing off-grid solar PV technologies. Implementing solar PV renewable energy technology will empower Khutsong SMMEs to function as small-scale electricity-embedded generators, sell electricity back into the grid, or store it to sustain their business during power outages. This approach will contribute to the South African government's urban and rural electrification goals.

This research discovered that the IEP (2003:181 and 182) presents multiple opportunities to establish a conducive environment for operationalising the REI4P at local government. Merafong City can leverage the IEP to operationalise the REI4P as an LED activity and

strategically integrate Khutsong township-based SMMEs by ensuring that its IDP and LED are aligned to national energy goals in the following areas:

1. *Innovative Renewable Energy Technology:* municipalities, including Merafong City, are expected to introduce innovative renewable energy technology for power generation, distribution, and metering. This includes the decentralisation of control and distribution through a bidirectional flow approach. This allows renewable solar PV energy consumption and enables SMMEs to operate as SSEEGs, injecting additional energy into the power grid and contributing to the local economy. The introduction of REI4P at the Merafong City local government level will be a practical and reactive technological approach. To expand reliable and affordable renewable energy access to township commercial communities. It will simultaneously help Merafong City local municipality to address their fiscal challenges associated with load reduction and the culture of non-payment.
2. *Solar PV Rooftop Installations:* Specifically, for the Merafong City Local Municipality (MCLM), solar PV rooftop installations emerge as a strategic policy intervention. This option addresses challenges faced by Khutsong township-based SMMEs and the municipality, including load reduction, non-payment culture, municipal debt, and rising retail electricity costs. The Integrated Energy Plan (2003:182) suggests that local governments and non-governmental organizations should be guided to adopt or formulate rules and regulations concerning solar panel incentives. This approach creates a balanced environment for Merafong City commercial energy consumers to implement small-scale distributed generation, addressing the effects of power outages on business operations and meeting their electricity needs.
3. *Greenhouse Gas Emission Reduction:* Implementing renewable energy technologies at the local government level, as recommended by the Integrated Energy Plan (2003:182), also brings the added advantage of reducing the emission of greenhouse gases. Storing renewable electricity from concentrated solar rooftop power creates a more sustainable and environmentally friendly energy ecosystem.

The study discovered that the Integrated Energy Plan, 2003 provides Merafong City with a comprehensive and tailored framework to operationalise the REI4P effectively as an LED

initiative. It ensures that its IDP and LED plan align and reflect the national energy goals discussed above. Merafong City can address immediate energy challenges and contribute significantly to economic development and environmental sustainability at both the local and national levels.

4.5.2.2. *The Integrated Resource Plan, 2019.*

The Integrated Resource Plan (IRP) (2019:08) serves as a pivotal framework that Merafong City can strategically leverage to operationalise the REI4P initiative, acting as a catalyst for LED. This plan can be conceptualised as an electricity infrastructure development plan to balance the least-cost electricity supply and power demand balance. It aims to minimise harmful emissions and water usage, aligning with crucial government goals of affordable electricity, reduced greenhouse gas (GHG) emissions, reduced water consumption, diversification of electricity generation sources, localisation, and regional development.

The Integrated Resource Plan (2019:16) offers a unique opportunity to diversify power generation by encouraging consumers, including Merafong City commercial residents, to explore alternative electricity generation methods. This includes the installation of solar panels on rooftops, fostering the development of a new localised power supply value-chain industry and job creation. This aligns with the goals of the REI4P and opens avenues for local economic empowerment.

To operationalise the REI4P at the micro-municipal level and integrate SMMEs from Khutsong Township into the competitive large-scale renewable energy project. Merafong City can leverage the IRP as a guide to identify preferred generation technologies, aligning with government goals in the following manner:

1. **Access:** The plan highlights that three million South African households still lack access to grid-based electricity. To address this, Merafong City must adopt the necessary infrastructure for grid-based renewable solar energy connections. This will allow Khutsong township-based SMMEs to act as SSEEGs, utilising smart grid distributed generation.
Simultaneously, this will provide a thermal power supply to support business operations such as cooking, space heating, and refrigeration, ensuring sustained profitability.

2. *Financial Viability and Non-Technical Losses:* Introducing Renewable Solar SSEEGs that sell electricity back to the grid can aid the Merafong City Local Municipality recover from its Eskom electricity bulk purchasing debt. This renewable energy initiative has the potential to revitalise the municipality's fiscal framework, addressing poor credit control systems and mitigating the culture of non-payment and theft through measures like meter bypassing, copper theft, and cable vandalism.

This research discovered that leveraging the 2019 IRP can position Merafong City at the forefront of sustainable energy development. By addressing specific challenges and opportunities outlined in the plan, the municipality can enhance its energy infrastructure and contribute significantly to local economic development and environmental sustainability through the effective implementation of the REI4P.

4.5.2.3. Electricity Regulation Act (ERA), No. 4 of 2006: Amendment to Schedule 2 & The Electricity Pricing Policy, 2008.

According to Montmasson-Clair, Kritzinger, Scholtz, and Gulati (2017:14) and the South African Local Government Association Legislation and Policy Guide (2017:15 & 16), the Electricity Regulation Act (ERA), No. 4 of 2006: Amendment to Schedule 2 & The Electricity Pricing Policy, 2008.

These frameworks were identified as comprehensive regulatory frameworks that can inform the rules and regulations that Merafong City can apply when procuring electricity from Khutsong township-based SMMEs solar PV renewable SSEEGs. The Merafong City's Solar PV SSEEGs procurement regulatory framework can comprise of the following sections:

1. *Regulatory Financial Risks and Opportunities:* The ERA amendment and the Electricity Pricing Policy highlight crucial regulatory financial risks and opportunities essential for Merafong City's successful participation in the large-scale renewable energy national project. The proposed procuring energy business model encourages municipalities to become power procurers, utilising existing infrastructure instead of building and operating new power plants.

This approach, as endorsed by Montmasson-Clair et al. (2017:14), presents an opportunity for Merafong City to leverage the REI4P as a catalyst for LED by allowing the municipality to procure Khutsong township-based solar PV SSEEGs, which will make use of their

businesses roof structure to install solar panel and generate electricity which reduces the implementation costs of setting up a solar plant. Consequently, some regulatory risks may arise that the municipality will need to consider, such as: i) the lack of clarity about the entity that would be reliable for procuring the power from SSEG; ii) the draft licensing exemption and registration notice published on the Department of Energy (DoE) website has not outlined the specific cap on the allocation of the embedded generation; iii) The framework regulating SSEG which stipulates the conditions for municipalities to purchase excess power generated by SSEG has not been finalised rests on the National Energy Regulator of South Africa (NERSA).

However, Montmasson-Clair et al. (2017:14) identified regulatory opportunities essential for Merafong City to navigate and capitalise on: i) municipalities' exemption from making long-term power purchases from IPPs. The ERA, New Generation Capacity regulations, and Eskom's role as a central buyer of power from IPPs through private companies awarded the REI4P tender offer avenues for municipalities to participate without long-term commitments. ii) Additionally, renewable energy-based IPP projects require a generation license, aligning with the municipality's role as a power procurer.

Other key financial risks outlined in Montmasson-Clair et al.'s (2017:14) discussion paper resonate with the ERA amendment and the Electricity Pricing Policy include: i) the short 1-year validity duration of tariffs entails that municipalities can set electricity tariffs, but these are only valid for 12 months. This creates uncertainty and may impact long-term planning, and ii) restrictions on tariffs for SSEGs selling excess power the grid cannot exceed Eskom's Megaflex rate; therefore, this limitation may affect the financial viability of SSEGs.

It was discovered in this study that by strategically leveraging the ERA amendment and the Electricity Pricing Policy, Merafong City can overcome regulatory, financial, and fiscal challenges, unlocking opportunities for active participation in the REI4P initiative. Aligning with these frameworks will facilitate LED and establish transparent, cost-reflective tariffs, contributing to sustainable energy practices and economic growth.

4.5.2.4. Energy Act, No 34 of 2008.

The Energy Act, No. 34 of 2008, emerges as a pivotal framework that empowers Merafong City to contribute to existing renewable development energy research based on strategically leveraging REI4P as a catalyst for LED. Merafong City can harness the provisions of this Act to drive the REI4P as an LED initiative in the following ways:

1. *Promoting Local Economic Development:* Section 5 of The Energy Act (2008:10) specifically outlines opportunities for local municipalities, such as Merafong City, to enhance LED by optimising energy use and leveraging existing infrastructure. This presents a significant avenue for including township-based Small, Medium, and Micro Enterprises (SMMEs) in Khutsong. Merafong City can be crucial in facilitating this inclusion by implementing governance procedures in line with the Public Finance Management Act (PFMA). Additionally, the municipality can empower Khutsong township-based SMMEs as rooftop solar PV SSEEGs through information and training initiatives, primarily focusing on renewable solar energy. Technical and Vocational Education and Training (TVET) courses can be employed to educate Khutsong SMMEs about sustainable energy, affordability, cost-effectiveness, and other relevant areas of interest.
2. *Collaboration with stakeholders:* The Energy Act opens doors for collaborative efforts with institutions such as i) the German Agency for International Cooperation (GIZ), ii) The South-African German Energy Programme (SAGEN), iii) the South African Photovoltaic Industry Association (SALIVA) which can help Merafong City develop sustainable and township-specific solutions. In partnership with Westcol TVET collage to develop their Green energy skills and modular training courses in rooftop Solar PV energy and support the pilot of integrating Khutsong township-based SMMEs as solar PV SSEEGs. Therefore, help Merafong City to establish application and registration processes for embedded generators. The South African Local Government Association (SALGA) will serve as an active stakeholder to help Merafong City to voice its LED interests. Collaborations with these stakeholder entities can provide valuable insights, research, and expertise, strengthening the municipality's approach to leveraging the REI4P as a catalyst for LED.

3. Integration with REI4P: By aligning the objectives of the Energy Act with the goals of the REI4P as a LED activity, Merafong City can create a robust framework for the expansion of renewable energy. This alignment will ensure that the potential transformation of Merafong City into a Local Renewable Energy Development Zone, comprising a new network of energy supply, transportation, and consumption industries, economies, and cities, is carefully organised, contributing to the sustainable expansion of South Africa's economy.

This study discovered that the Energy Act, No. 34 of 2008, provides Merafong City with a comprehensive legislative foundation to drive the REI4P as a catalyst for LED. Through careful implementation of its provisions, the municipality can ensure a reliable and diverse energy supply and actively contribute to local economic development, job creation, and the sustainable growth of the region.

4.5.2.5. Integrated National Electrification Programme (INEP) 2012/2013.

The Integrated National Electrification Programme (INEP) 2012/2013, initiated in 2002, is a pivotal framework that Merafong City can strategically leverage to operationalise the Renewable Energy Independent Power Producer Procurement (REI4P) initiative, acting as a catalyst for Local Economic Development (LED). Bohlmann (2020:36) and Eskom's Integrated Report (2014:05) articulate that INEP's objectives include fostering integrated development, promoting industrial growth, reducing government debt, unlocking state value, and achieving universal access to electricity.

These objectives directly address the financial constraints faced by Merafong City, stemming from issues such as a culture of non-payment, meter bypassing, and load reduction that impact municipal operations. By effectively integrating Khutsong township-based Small, Medium, and Micro Enterprises (SMMEs) into the REI4P solar rooftop photovoltaic Small-Scale Embedded Generators (SSEGs), the municipality will contribute to the progressive realisation of the INEP's objectives mentioned above to empower Khutsong SMMEs to overcome challenges related to electricity insecurity. This can strengthen the financial position of the municipality, which will significantly contribute to the region's economic development. The strategic integration of Khutsong SMMEs into the REI4P aligns with the conditions of the sub-contractual agreement.

This integration is expected to strengthen the municipality's financial position as Khutsong township-based SMMEs, with secure and reliable electricity, can sustain their business operations and improve profits. With its overarching objectives, this study reveals that the INEP lays the foundation for Merafong City to actively participate in LED by integrating the REI4P.

4.5.2.6. *The Draft National Energy Efficiency Strategy, 2016.*

The Draft National Energy Efficiency Strategy, 2016, emerges as another framework Merafong City can strategically leverage to operationalise the REI4P initiative, acting as a catalyst for LED. The strategy provides local government institutions, such as the Merafong City Local Municipality, with a roadmap to integrate financial, institutional, and regulatory activities to lower energy use across all operations. The analysis of how Merafong City can align the Draft National Energy Efficiency Strategy with the REI4P for LED:

1. *Energy Reduction Targets:* The National Energy Efficiency Strategy (2016:14) sets a local government service goal for Merafong City to accelerate the reduction of energy consumption by municipal residents. The 20% target reduction in energy intensity is a benchmark, measured as energy consumption per head of the population served. Aligning these targets with the goals of the REI4P can contribute to both energy efficiency and economic development.
2. *Enabling Environment and Grants:* The Draft National Energy Efficiency Strategy (2016:17) establishes an environment that enables municipalities to acquire renewable energy efficiency grants through the Energy Efficiency Demand Side Management (EEDSM) programme. This initiative, initiated in 2009 by the Department of Energy (DoE), aids municipalities in unlocking their energy-saving potential. The Local Government Energy Efficiency and Renewable Energy Strategy further support this program, providing Merafong City with avenues to develop strategic interventions for energy efficiency and access to additional funding.
3. *Energy Efficiency Strategy Submission:* To operationalise the REI4P, Merafong City must submit an energy efficiency strategy that outlines energy management plans, municipal business and financial models, and fencing proposals. This submission is crucial for securing funding and prioritising environmental sustainability.

Aligning this strategy with the Gauteng provincial strategy and informed by a detailed energy audit based on electricity service delivery activities will enhance the municipality's ability to access opportunities and alternative financing mechanisms.

4. *Role of Township-Based SMMEs:* The strategy empowers Merafong City to enter into REI4P energy performance contracts with private sector bidders, facilitating the inclusion of Khutsong township-based SMMEs. This approach helps reduce the investment and debt burden on the municipality while creating opportunities for local businesses to participate actively in the renewable energy sector. The strategy allows municipalities like MCLM to choose energy-saving actions with the highest return on investment and secure funds from various channels, including competitive tenders. This creates opportunities for potential REI4P bidders to enter subcontracting arrangements with township-based SMMEs.

The National Energy Efficiency Strategy (2016:17) supports this by allowing SSEEGs to sell electricity back to the grid, encouraging collaboration between municipalities and local businesses.

This research discovered that the Draft National Energy Efficiency Strategy, 2016, offers Merafong City a comprehensive framework to synchronise efforts with the REI4P for LED. By aligning energy efficiency targets, leveraging grants, submitting robust energy efficiency strategies, and actively involving township-based SMMEs. The municipality can enhance its energy efficiency and drive economic development and sustainability in the region.

4.5.2.7. The Local Government Municipal Systems Act (MSA), No. 32 of 2000.

The Local Government Municipal Systems Act (MSA), No. 32 of 2000, stands as a pivotal framework that Merafong City can strategically leverage to operationalise the REI4P initiative, acting as a catalyst for LED. Here's an analysis of how Merafong City can align the Municipal Systems Act with the REI4P for LED:

1. *Socio-Economic Development Mandate:* The Municipal Systems Act, according to the South African Local Government Association Renewable Energy Scenarios for South African Municipalities (2018:04), provides a core mechanism enabling local governments to fulfil their socio-economic development mandate.

Merafong City can use this framework to drive renewable energy initiatives that contribute to economic development by prioritising equitable universal access to reliable, affordable, and environmentally sustainable electric services.

2. *Integrated Planning and Constitutional Alignment:* Operating concurrently with Sections 152 and 153 of the Constitution of the Republic of South Africa, 1996. The Municipal Systems Act facilitates integrated socio-economic, environmental, spatial, and infrastructural planning. This alignment ensures that Merafong City follows constitutional principles while institutionalising planning processes that consider the fundamental right to sustainable development outlined in Section 24 of the Constitution.
3. *IDP Amendment and Feasibility Assessment:* To operationalise the REI4P, the Merafong City Local Municipality needs to amend its IDP at the beginning of each five-year election term, ensuring alignment with the Municipal Systems Act. This amendment should undergo a financial and organisational feasibility assessment to guarantee the municipality's capacity to coordinate renewable energy projects. The focus is on long-term township economic development through energy efficiency, explicitly addressing challenges Khutsong township SMMEs face.
4. *Reviewing Power Supply Systems:* Leveraging the REI4P as an LED initiative calls for a comprehensive review of power supply systems by the Merafong City local government. New off-grid and tariff systems should address the consequences of load-shedding and load reduction experienced by Khutsong township-based SMMEs. Solar rooftop PV renewable energy systems can be employed to power their business operations, mitigating the impact of debt while helping the municipality overcome financial challenges.

A rigorous assessment of the Municipal Systems Act discovered that the act could provide Merafong City with a robust framework to align its socio-economic development goals with renewable energy initiatives. By adhering to constitutional principles, amending the IDP with a feasibility assessment, and implementing tailored power supply systems, the municipality can effectively operationalise the REI4P as a catalyst for LED, fostering sustainable development in the region.

4.5.2.8. Preferential Procurement Policy Framework Act (PPPFA) 2000: Preferential Procurement Regulation, 2017.

Sections 12(1) and 12(3) of PPPFA, 2000, create an enabling environment for Merafong City to integrate Khutsong township-based SMMEs into the REI4P procurement processes. This involves incorporating township-based SMMEs into the national renewable energy program through competitive tenders. The municipality can encourage potential REIPPPP bidders to establish subcontracting arrangements with township-based SMMEs. These entities, recognised as Exempted Micro Enterprises (EMEs), can contribute as Renewable Solar Small-Scale Energy Embedded Generators (SSEEGs), selling electricity back to the grid. This aligns with section 12(3), ensuring a minimum of 25% of the value of the state contract is attributed to SSEEGs.

The researcher found that the Merafong City municipality can exercise its conferred legislative authority as an organ of the state in terms of section 12 (1). That stipulates that a person awarded a tender may enter into a subcontracting agreement with the approval of the organ of the state. This would require Merafong City to identify private companies within their jurisdiction that have been awarded the REI4P tender. To negotiate the terms of a sub-contractual agreement on behalf of Khutsong SMMEs. Thus, regarding Khutsong SMMEs as Exempted Micro Enterprises (EMEs) as per section 12(3), which outlines that the conditions of a competitive tender encourage prospective REIPPPPs bidder to enter into a subcontracting arrangement. Strategically integrating Khutsong SMMEs into the REI4P as small-scale rooftop PV Energy Embedded Generators (SSEEG). To sell electricity back to the grid, valued at a minimum of 25% of the state contract value. Or store the additional energy generated to mitigate the adverse effects of electricity insecurity to keep their business operating during loadshedding, strengthening local economic activity. It is important to highlight that Merafong City will need to develop a hybrid electrification system to cater to the preferences and needs of each SMME owner to be on-grid or off-grid rooftop Solar PV Systems.

4.5.2.9. Township Economic Development Act 2022.

The Township Economic Development Act (2022:08) emerges as a crucial regulatory framework, offering a strategic opportunity for Merafong City to breathe new life into its local economy, particularly in the Khutsong township. By aligning this framework with the REI4P initiative, Merafong City can address the challenges discovered about its current economic and development profile mentioned above in the following ways: i) *Economic Resuscitation Through REI4P*: The Township Economic Development Act provides a platform for Merafong City to leverage the REI4P initiative, a pivotal move to revitalise the local economy, which heavily relies on the mining sector facing imminent collapse. ii) *Overcoming Historical Imbalances and policy incoherence*: By tapping into the REI4P, Merafong City can overcome historical exclusions faced by township-based businesses.

In the past, conservative fiscal regulations hindered access to start-up capital, perpetuating a resistant lending culture. Therefore, leveraging the REI4P as a catalyst for LED will serve as an approach to addressing the apparent absence of a clear framework to create an enabling environment for the integration of non-traditional informal township-based SMMEs such as those of Khutsong to partner and participate in the complex renewable energy monopoly.

iii) *Township Economic Policy*: The Township Economic Development Act functions as a township economic policy, offering a foundation for Khutsong SMMEs to explore their potential. Section 11 of the act will significantly enable Merafong City to use REI4P as an LED catalyst to expose these SMMEs to multiple alternative green funds. It was discovered that the Merafong City municipality, when leveraging the REI4P as a catalyst for LED.

It will need to develop a climate change and renewable energy efficiency strategy to help it introduce alternative building and renewable energy technology standards at the local government level. Therefore, this strategy will enable the municipality to consider the following factors which inform their municipal by-laws: i) *Rooftop Solar PV as New Building Standard*: A proposed by-law should invite Khutsong businesses to renovate roofs and install solar panels. This not only combats climate change but also addresses power cuts, load reduction, and municipal debt, aligning with the goals of the REI4P.

ii) *Incentives for Township-Based SMMEs*: Information in the proposal should emphasise how disadvantaged township-based SMMEs can secure incentives to offset the impact of the electricity service delivery crisis on their operations. The REI4P's eagerness to invest in local government is crucial for boosting the township economy through rooftop solar PV installations. iii) *Identifying Sector-Specific Financial Needs*: The act will aid Merafong City's small enterprise development unit identify which Khutsong sectors require financial assistance. Business plans are prepared to support project proposals that meet financial assistance criteria. iv) *Establishing Financial Assistance Administration Systems*: The municipality must design systems to monitor funds and repayment mechanisms used by Khutsong enterprises to ensure transparency and curb financial misconduct. It was discovered that this act is a powerful instrument that advocates for township economic development, providing a platform for Merafong City to acquire financial support from the multiple REI4P green funds to benefit Khutsong SMMEs as rooftop solar PV SSEEGs. It promotes sustainable growth, empowers local businesses, and contributes to the overall resilience of the municipality's economy.

4.4.2.10. A set of rules, standards, and regulations will govern the implementation of the REIPPPP at the micro-municipal level.

In operationalising the REI4P as a catalyst for LED, Merafong City will need to rely on a comprehensive set of standards, rules, and regulations. These guidelines ensure a seamless integration of renewable energy initiatives, mainly focusing on the micro-municipal level. The following norms and regulations, in addition to previously mentioned frameworks, play a pivotal role in ensuring that Merafong City successfully leverages the REI4P as an initiative for LED:

1. *Municipal Spatial Development Framework (MSDF)*: The MSDF will serve as a critical tool, governing the geographical extent of land uses within Merafong City, in alignment with Merafong City's IDP. It will guide the amendment of the municipality's vision, goals, and objectives with a particular emphasis on energy efficiency and climate change.
2. *South African Renewable Power Plants Grid Code (SARPPGC)*: SARPPGC outlines technical requirements and grid connection design standards for renewable power plants connecting to South Africa's transmission or distribution network.

This will ensure that Merafong City's REI4P LED project will comply with industry-specific standards, promoting safety and efficiency. The Merafong City will need to ensure that Khutsong SMMEs buildings comply with the Department of Human Settlements National Norms and Standards to ensure that installing rooftop solar PV panel systems complies with South African Bureau of Standards (SABS) energy-efficient building renovations. Therefore, the municipality must ensure that these renovations align with the broader objective of incorporating sustainability measures into the existing infrastructure, contributing to the overall energy efficiency goals of the Merafong City municipality.

3. *Consultation Paper on SSEG*: The municipality will also need to consult the Consultation Paper on SSEG to help Merafong City decentralise the REI4P process and planning systems. To create an enabling environment for Khutsong SMMEs to partner and participate in the REI4P as SSEGs. This outcome will be a fair balance between deploying SSEGs and meeting national energy needs.

Therefore, Merafong City can improve its financial performance while advocating and protecting Khutsong township SMMEs, a key beneficiary of the REI4P.

4. *Energy Efficiency Strategy Approval*: Merafong City should develop an energy efficiency strategy aligned with the Municipal Finance Management Act and seek approval from the municipal council. This strategy, adopted as an energy audit resolution, will guide the municipality's decisions regarding renewable energy procurement. ii) *Competitive Tender Processes*: The municipality, guided by the PPPFA and its regulations, should employ competitive tender processes for REI4P initiatives. Encouraging potential bidders to engage township-based SMMEs in subcontracting arrangements will contribute to local economic development. iii) *Tariff Regulation and Oversight*: Following acquiring a service provider, Merafong City must be responsible for setting and regulating electricity tariffs guided by NERSA. This ensures that the benefits of the REI4P are effectively managed and contribute to LED while promoting sustainable energy practices.

In summary, this study discovered that Merafong City can strategically adapt these standards, rules, and regulations to facilitate the integration of the REI4P at the micro-municipal level. The holistic approach ensures compliance with technical requirements and aligns with broader objectives related to sustainability, economic development, and the community's well-being.

4.6. Fostering Skills Development and Economic Growth in Khutsong Township's Economy Through the REIPPPP Strategy.

4.6.1. Introduction.

A rigorous examination of the International Energy Agency's findings on Skills Development and Inclusivity for Clean Energy Transitions (2022:12) and the South African government commissioned a National Employment Vulnerability Assessment (NEVA. The Department of Environment, Forestry, Fisheries and Trade and Industry commissioned it. It was found that the national renewable energy initiative necessitates a highly skilled workforce in the clean energy industry.

This implies that employees within the traditional energy sector must have the necessary skill set and knowledge, affording them a fair chance to participate and find employment in the renewable energy sector. This discovery implies that the implementation of the REI4P necessitates the development of training and educational programs aligned with the emerging renewable energy industry to bridge the significant skills and labour gap.

This shift will create an employment and skills gap, presenting an opportunity to create an enabling environment for the South African economy and capitalise on maximising people-centred benefits through inclusive clean energy opportunities. This realisation leads to the second sub-research objective of this paper: to investigate the economic and skills development opportunities that the REI4P, functioning as a catalyst for LED, can bring about in Khutsong.

4.6.2. Khutsong Township-based SMMEs Renewable Solar Energy Skills and Knowledge Gap.

Table 4.9: Thematic Analysis: Empowering Township SMMEs through Renewable Energy Education and Skill Development.

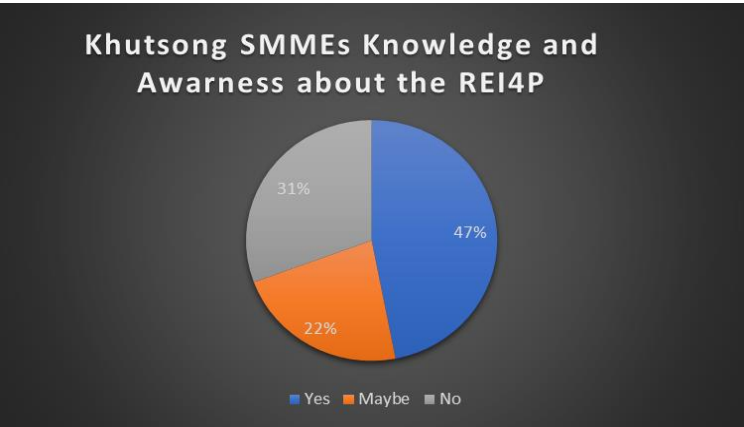
Theme	Related Codes	Exemplary statements.
Empowering Township SMMEs through Renewable Energy Education and Skill Development. <u>Definition:</u> This theme focuses on the transformative potential of providing education and skill development in renewable energy to Khutsong SMMEs with the knowledge and skills necessary for harnessing renewable energy. It focuses on strategies to empower these businesses through educational programs, fostering a sustainable environment for adopting renewable energy practices.	● Preferences and Specific Interests, ● Education, Skill and Employment Opportunities, Local Development	● <i>I would rather do a course in food as it's my niche.</i> ● <i>I am interested in studying something I am passionate about, which is accounting or business-related.</i> ● <i>I am quite old for school however i run my business with my younger son and I would rather have him go learn about renewable energy.</i> ● <i>Personally, I'm not interested in learning about solar because I would rather reskill myself, as an accounting student.</i> ● <i>"I, as a business owner, would rather be interested in enrolling in a musical or business development course.</i> ● <i>"I am willing to enrol and attend a part-time short course after work hours to gain knowledge on how to install and maintain solar panels and acquire additional skills.</i> ● <i>I also express my interest in enrolling with a TVET college to further my skills and knowledge. I firmly believe in the saying 'knowledge is power,' and I am excited about the prospect of learning the scientific and technical aspects of solar panel systems.</i> ● <i>I would like to understand how the rooftop solar panel operates so I can identify any problems and know how to fix them. I'm willing to enrol in a TVET college to acquire the necessary skill sets because I believe it's easier to make use of something when you have a thorough understanding of how it operates.</i> ● <i>It will create employment opportunities for unemployed individuals in Khutsong, whom I</i>

	● Mitigating Electricity Insecurity, extra-income generation, and energy storage	can hire. ● <i>I believe that the REI4P will play a crucial role in saving an emerging ghost town, currently sustained by mines that are on the brink of collapsing due to reaching the end of their lifespan.</i> ● <i>Introducing solar energy can help alleviate the economic challenges in Khutsong by creating new employment opportunities and paving the way for the introduction of academic courses focused on solar renewable energy.</i> ● <i>Awareness campaigns can inspire the youth to enrol in college, acquiring the essential skill sets and knowledge necessary to seize this emerging opportunity. I firmly believe that this approach will contribute significantly to overcoming the socio-economic challenges faced by the Khutsong youth, including issues related to drug and alcohol abuse, as well as combating the tendency to be "Mahlalela" or a stay-at-home couch potato.</i> ● <i>"To gain knowledge about the renewable energy initiative and gain the necessary skills they can utilize for their business operations."</i> ● <i>"To acquire a certificate and gain knowledge about maintaining the solar panel to be installed and how to store power and which appliances consume less or more solar power."</i> ● <i>This knowledge will empower the local community, and I see the combination of solar energy and storage as a progressive move that will contribute to the growth of the township economy.</i> ● <i>I maintain that the implementation of the REI4P project will empower my business significantly. Running at 100% for 8 hours with no interruptions, it will enable me to generate more profits and, in return.</i> ● <i>I am willing to be subcontracted for a subsidised solar panel installation to generate additional power to help run my business operation.</i> ● <i>I prefer to store the power to ensure that I have</i>
--	--	--

		<i>available energy on standby to keep the power running and help my business run.</i>
--	--	---

The thematic analysis of the primary data collected from participants identified a set of key findings that reflect the expectations of Khutsong SMMEs. These findings highlight aspects Merafong City must consider when leveraging the REI4P as a catalyst for local development. It should be able to empower Khutsong township-based SMMEs by providing education, skills, and employment opportunities. Simultaneously, it should help SMMEs mitigate the impact of electricity insecurity in order to improve and develop their local economy.

Figure 4.5: Khutsong SMMEs REI4P Knowledge and Awareness Gap.



(Self-created).

Khutsong township-based SMMEs respondents were asked: Do you have any knowledge or have heard about the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or Independent Power Producers (IPP)? (Yes, Maybe, No).

The key theme that emerged from the data analysis was 'Empowering Township SMMEs Through Renewable Energy Education and Skill Development.' The findings in the theme demonstrated that there is a significant knowledge and skills gap in renewable energy. This finding is furthered by Figure 4.5 above, which illustrates the considerable knowledge and skills gap identified among Khutsong township-based SMMEs. It was found that 47% of the Khutsong SMME businesses have good knowledge and heard about the REI4P, while 22% have some knowledge, and 31% have not heard of the initiative.

The findings within this theme indicate a high interest among the Khutsong SMME township population to enrol in a TVET college for a short course. The course should provide education on renewable solar energy, solar installation, and maintenance, with the ultimate goal of obtaining an accredited certificate of completion. This accreditation will render them eligible to capitalise on emerging opportunities in developing renewable energy skills and employment. Figure 4.6 below further supports this discovery, illustrating the interest of Khutsong SMMEs in enrolling in Westcol TVET College's Renewable Energy Skills Development Programme. This finding underscores a significant knowledge and skills gap within the case study area.

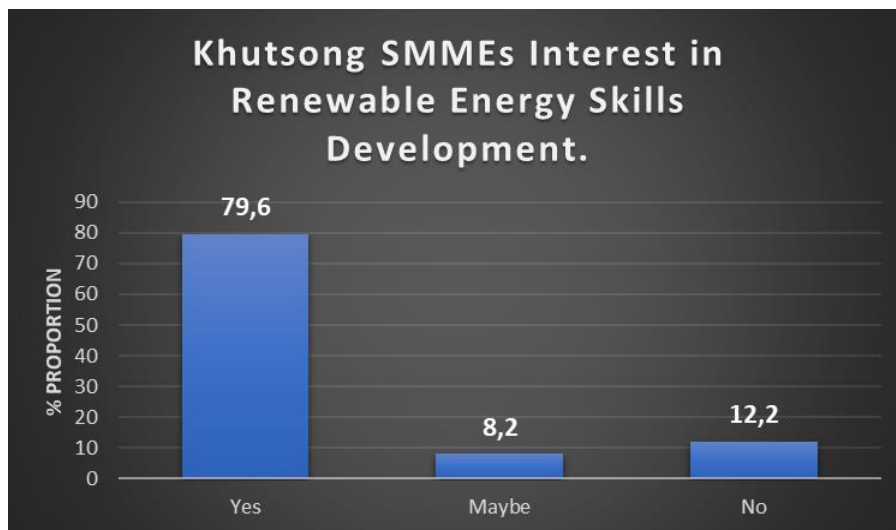
Notably, 79.6% of SMME owners have expressed their interest in enrolling with a TVET College to acquire the necessary knowledge and skills as prospective small-scale electricity embedded generators. Participants articulated their motivations extracted from exemplary statements as follows: i) *“To gain knowledge about the renewable energy initiative and acquire the necessary skills they can utilise for their business operations.”* ii) *“To acquire a certificate and gain knowledge about maintaining the solar panel to be installed, and how to store power and which appliances consume less or more solar power.”*

An 8.2% segment remained undecided about enrolling, citing concerns about age. One participant stated, *“I am quite old for school; however, I run my business with my younger son, and I would rather have him go learn about renewable energy”*.

On the other hand, 12.2% responded with a definite no, citing their lack of trust in the government and a declining moral status towards it. This group also aligns with SMME owners expressing a preference and specific interest in becoming experts in their existing industry, as expressed in the following exemplary statements:

i) *“I would rather do a course in food as it's my niche.”* ii) *“I am interested in studying something I am passionate about, which is account or business-related.”*

Figure 4.6: Khutsong SMME Owner's Interest in Green Education and Skills Development.



(Self-created).

Khutsong township-based SMME respondents were asked: Would you enrol with a local TVET college for a Renewable Energy and skills development course?

Khutsong township SMME owners reported that if Merafong City successfully leverages the REI4P as a catalyst for LED, rolling out rooftop solar PV systems to strategically integrate Khutsong SMMEs as SSEEG will empower their business operations in the following ways: i) Mitigating the adverse effects of electricity insecurity: *“I maintain that the implementation of the REI4P project will empower my business significantly. Running at 100% for 8 hours with no interruptions, it will enable me to generate more profits.”* ii) Generating extra income: *“I am willing to be subcontracted for a subsidised solar panel installation to generate additional power to help run my business operations.”* iii) Storing additional energy: *“I prefer to store the power to ensure that I have available energy on standby to keep the power running and help my business run.”*

The thematic analysis in Table 4.9 indicates that Merafong City can be crucial in leveraging the REI4P program LED. This finding necessitates that Merafong City develop a renewable energy educational, skills, and employment strategy in collaboration with key stakeholders. Therefore, the strategy should possess the capacity and potential to empower Khutsong SMMEs, youth, and the community. It will introduce renewable energy education and skill development, creating numerous employment opportunities. This initiative is expected to alleviate poverty, reduce unemployment, and mitigate crime and drug abuse in the township.

4.6.3. Merafong City REI4P in Khustong's Economic and Skills Development.

The operationalisation of the REI4P as a catalyst for LED can potentially empower Khutsong township-based SMMEs to overcome the barriers of job creation, skills development, and community empowerment posed by electricity insecurity in Khustong's local economy and development. This study discovered that some SMMEs had to lay off their employees while others' wages were reduced, making it hard for them to sustain their basic lifestyle of providing for their families paying rent and school fees.

“The major risks associated with Loadshedding also affect my earning patterns as I earn per output. It makes it hard for me to generate a suitable income to provide for my family, pay rent and school fees, and cover any essential lifestyle expenditures. Consequently, I've had to change my spending patterns due to inflation affecting the cost of living and affordability.”

The operationalisation of the REI4P as a catalyst for LED in Merafong City has several potential levers at its disposal to protect and rehabilitate the local industry. Therefore, a rigorous examination of the South African Renewable Energy Masterplan (SAREM) (2022:38), and the work of Van der Walt, Van de Berg, and Cameron (2017:173) revealed that for the operationalisation of the REI4P as an LED strategy to foster economic and skills development in Merafong City. The municipality must partner with the Department of Higher Education and Training (DHET), specifically Technical Vocational Education and Training (TVET) colleges. These institutions can educate learners with the employment-related scientific and technical knowledge and skills needed to penetrate the green energy labour market.

The following key stakeholders were identified as crucial for implementing the operationalisation of the REI4P as an LED strategy: i) Westcol TVET College in Merafong, ii) Manufacturing Engineering Related Services Education Sector and Training Authority (MerSETA), iii) Energy and Water Sector Education and Training Authority (EWSETA) and iv) South African Renewable Energy Technology Centre (SARETEC). For Merafong City to foster rooftop solar PV energy, economic development, and skills development in Merafong City, these initiatives can be administered through existing government programs such as the Expanded Public Works Programme (EPWP), Harambee, and Yes4Youth.

Partnering with the stakeholders as mentioned above can help Merafong City foster educational, skills development, and employment opportunities in Khutsong Township in the following ways:

4.6.3.1. Khutsong SMME Education,

The establishment of the Green Economy Academic Curriculum will enable the Merafong City Local Municipality to launch the first green TVET college. This initiative aims to revitalize the existing college, Westcol, by offering corporate and academic vocational programs in renewable energy and efficiency technology. These programs will provide specialization certifications in procurement, manufacturing, transport, solar panel installation, grid connection, and operation and maintenance. These certifications will be aligned with the skills gap identified in the emerging Local Renewable Energy Development Zone labour market, as outlined by The International Labour Organization's Skills for Green Jobs in South Africa (2018:36).

1. *The Industrial Resource and Energy Efficiency corporate course:* will cater to improving and developing municipal officials' knowledge to understand how solar PV energy works, giving them insight relating to regulations, norms, and standards. This training program will equip local government officials with the necessary skills to oversee the successful implementation of the REI4P as a catalyst for LED and understand how to manage the integration and distribution of solar power on or off the grid.
2. *The Young Renewable Energy Efficiency Technology Professional Development internships, learnerships, and capacity-building programs* will assist young township-based graduates in acquiring the necessary skill set and relevant work experience demanded by the green economy labour market. This approach will aid in bridging the gap between qualifications and skills required by the employer while also providing mining sector professionals, Merafong City local municipality officials, and existing Westcol academic lecturers with the opportunity to re-skill and expand their capabilities.

All the programmes mentioned above are critical components to progressively create renewable energy employment opportunities in the current energy sector workforce. Re-skilling and training highly qualified and well-experienced management-level electricians as rooftop solar PV site managers, electricians, engineering lecturers, Khutsong township-based SMME owners with primary education, and youth graduates with vocational training to be re-skilled as PV electrical and mechanical assemblers.

Moreover, they will play a critical role in bridging the knowledge and awareness gap of Khutsong SMMEs in Figure 4.5 and Figure 4.6 above in response to Khutsong SMME's renewable energy interests and knowledge gap.

“I also express my interest in enrolling with a TVET college to further my skills and knowledge. I firmly believe in the saying 'knowledge is power,' and I am excited about the prospect of learning the scientific and technical aspects of solar panel systems.”

Introducing a green economy academic curriculum in Westcol TVET college is expected to drive township economic development. This initiative aims to localise manufacturing, providing opportunities for Khutsong township-based SMMEs to enrol in skill development programs. These programs will teach them to produce battery energy storage and solar system components. The corporate and academic curriculum development will address the gap between demand-led skill development training and the ability to expand into township-localized manufacturing markets. Localised manufacturing will help break the monopoly dominance in supply and value chains, contributing to the growth of township SMMEs.

The academic programs mentioned in this study are strategic interventions to identify, promote, and support new opportunities for producing renewable solar PV energy goods and services. By integrating Khutsong township-based enterprises into the REI4P, these interventions reinforce the decentralisation of monopolistic dominance in various sectors of the South African economy. They promote pro-poor LED policy approaches to support existing township enterprises in Khutsong to tap into their manufacturing and productive capacity potential. This prioritises the development of local manufacturing cooperatives. The enactment of this pro-poor policy approach serves as a strategic intervention to progressively break down existing monopolies that continue to capture township economies, according to the Township Economic Revitalization Strategy (2019:21).

4.6.3.2. Khutsong SMMEs Skills Development:

The International Labour Organization's Skills for Green Jobs in South Africa (2018:36) suggests that the implementation of the green economy corporate and academic curriculum by Westcol TVET College can assist the Merafong City Local Municipality in improving its EPWP. This improvement can be achieved by initiating and driving multiple green economy awareness campaigns. These campaigns would involve introducing green skill projects to demonstrate and raise awareness of the impact of climate change on local governments.

The EPWP Green Skills projects would help build the capacity to integrate green skills across informal and formal business sectors in the national skills system.

According to the International Energy Agency (2022:40), this approach will mark the first cross-sectoral green skills development approach, supporting the establishing of an environmentally green economy. The Sector Education and Training Authority (SETA) will play a significant role in authorising the collaborative and strategic partnership between Merafong City and Westcol TVET College to develop the Green Economy Academic Curriculum in alignment with the 2010 Environmental Sector Skills Plan (ESSP). This aims to bridge the existing supply gaps of scarce green energy skills. The outcome will create an enabling environment for Merafong City to play a significant role in crafting environmental sector skills such as leadership, provision of critical and stable environments, and strategic planning for identifying vital areas requiring reskilling. This will update sustainable development planning and risk management capacity, assisting local governments in demonstrating their commitment to sustainable development, energy efficiency, and renewable energy.

The operationalisation of the REI4P as an LED activity in local government can significantly assist Merafong City in playing a role in encouraging economic and skill development within Khutsong township and its economy. This can be achieved by introducing a Renewable Energy System and Skilling for Smart Solar Model, a project to support the sustainable production and management of solar power and non-grid electrification systems. Developing a hybrid electrification system targeted at marginalised township-based commercial sectors would encourage economic and skill development by installing Solar Home Systems (SHS). Both the skills mentioned in these development programs have the potential to stimulate employment in renewable energy efficiency technology, creating job opportunities while simultaneously improving environmental sustainability at the micro-municipal level. These skills development programs can strengthen the correlation between job creation and skills development, benefiting Khutsong Township and promoting economic development.

It is important to highlight the integration of Green skills projects in addressing climate change awareness at Westcol TVET College. Can offer corporate and academic renewable energy and efficiency technology vocational programs, providing specialisation certifications in fields such as i) procurement, ii) manufacturing, iii) transport, iv) solar panel installation, v) grid connection, and vi) operation and maintenance.

4.6.3.3. Khutsong SMMEs Development and Employment Opportunities:

According to the South African Renewable Energy Master Plan (2022:36), the successful implementation of the REI4P requires a competitive, qualified, and skilled workforce. Therefore, a renewable energy education, skills, and employment strategy is crucial to creating an environment that enables Merafong City to tap into a renewable energy manufacturing hub. When implemented, this strategy can transform Merafong City into a Local Renewable Energy Development Zone. Comprising a new network of industries, economies, and cities. The Khutsong township economy falls under the West Rand District Municipality, aligns with the critical requirements of expanding the Western Electricity Grid Infrastructure power corridor, as indicated by City Press News (2019:01) and Laurie, van Zyl, and Barbour (2019:07) which are as follows:

1. The Merafong City Local Municipality, with its 1871.5 kWh/wp specific photovoltaic power output and direct normal radiation of 2189.3 kWh/m² annually, (figure 4.3 on page 78). It has the potential to become a green economy that can expand along the Western Electricity Grid Infrastructure power corridor and can support South Africa's national energy transition, particularly in promoting technological innovation and industry potential in solar renewable energy.
2. It consists of Khutsong, a predominantly Uranium and Gold mining township economy that can be leveraged to support the industrialisation of solar energy. To help rehabilitate a mining township economy into a Local Renewable Energy Development Zone, according to the World Bank Group (2022:17). The industrialisation of the Merafong City Local Municipality as a Local Renewable Energy Development Zone can help improve its labour, educational and economic profile preventing it from becoming a ghost town.
3. It will play a significant role in helping South Africa unlock its technological innovation and industry potential in solar renewable energy. It can help promote and build a resilient manufacturing and supply chain through township economies. It is located adjacent to the Lanseria Airport and Maropeng World Heritage Sites.

The potential transformation of Merafong City into a Local Renewable Energy Development Zone, comprising a new network of industries, economies, and cities. It will offer local manufacturing employment opportunities to Khutsong township-based SMMEs who have acquired skills and training in manufacturing.

To manufacture and supply solar and energy storage systems assembly, modules, inverters, mounting structures and cabling, and cabling of solar panels, as well as the battery packs, casing materials, battery management systems, cooling systems, site, control, and energy management systems. Other employment opportunities that can emerge in the Merafong City transforming into a Local Renewable Energy Development Zone will be based on the reskilled official and Khutsong youth will be in i) procurement, ii) transport, iii) solar panel installation, iv) grid connection and v) operation and maintenance. According to Mkhize, Radmore, Scrimgeour and Raw (2020:32) Utility-Scale Renewable Energy: Market Intelligence Report. It is important to note that the manufacturing and supply market of battery energy storage and solar system components could benefit Khutsong Township's local economy and its residents, reducing the costs of material imports and the availability of materials.

4.7: CHAPTER SUMMARY.

This chapter presents and discusses the findings of the objectives of this research: (i) Explore how Merafong City can leverage the REI4P as a catalyst for LED and effectively integrate Khutsong Township-based SMMEs; (ii) Examine how electricity insecurity affects Khutsong SMME development and the local economy; (iii) To analyse what existing regulatory frameworks Merafong City can leverage to drive the REI4P as an LED initiative; and (iv) Investigate what economic and skills development opportunities can the REI4P as a catalyst for LED will bring in Khutsong. This study discovered that electricity insecurity poses multiple challenges that adversely affect Khutsong township-based SMMEs' business operations.

The challenges are i) poor operational efficiency, ii) safety & security, iii) loss of clients and staff, iv) impaired customer relations, v) loss of income, unplanned & wasteful expenditure, and vi) damaged electronic equipment and stock. Consequently, challenges of electricity insecurity such as unreliable load-shedding schedule, lack of maintenance and compensation for damages incurred, government support programs, community empowerment, local job creation & skills development are currently hindering Khutsong township's local economy and development.

The study discovered that Merafong City's local municipality, in terms of Sections 12(1) and 12(3) of PPPFA, 2000, has the potential to leverage the REI4P as a catalyst for LED successfully. Therefore, strategically integrating Khutsong township-based SMMEs to partner and participate in the REI4P as rooftop solar PV SSEEGs.

Could potentially transform and rehabilitate Merafong City into a Local Renewable Energy Development Zone, comprising a new network of industries, economies, and cities; ii) a green economy that can expand along the Western Electricity Grid Infrastructure power corridor and can support South Africa's national energy transition. That will offer local manufacturing employment opportunities to Khutsong township-based SMMEs who have acquired skills and training in manufacturing. Other employment opportunities will emerge from the reskilled official, and Khutsong youth will be in i) procurement, ii) transport, iii) solar panel installation, iv) grid connection and v) operation and maintenance.

Chapter 5.

Conclusion and Recommendations.

5.1. Introduction and Conclusion.

This research explored how Merafong City can leverage the REI4P as a catalyst for LED and concurrently facilitate the seamless integration of Khutsong Township-based SMMEs. The study affirms the existence of regulatory frameworks that MCLM can leverage to drive the REI4P into an LED initiative. Key among these frameworks is the Preferential Procurement Policy Framework Act (PPPFA), 2000, specifically in Sections 12(1) and 12(3). The MCLM's role would be to encourage potential REI4P private company bidders to enter into a sub-contracting agreement with Khutsong SMMEs valued at a minimum of 25% of the state contract as rooftop solar SSEEGs.

The strategic integration of Khutsong SMMEs will result in Merafong City's success in leveraging the REI4P to accelerate and stimulate LED. This research also discovered that Merafong City in leveraging the REI4P as a catalyst for LED, can potentially transform and rehabilitate Merafong City into a Local Renewable Energy Development Zone, comprising a new network of industries, economies, and cities; ii) a green economy that can expand along the Western Electricity Grid Infrastructure power corridor and can support South Africa's national energy transition. That will offer local manufacturing employment opportunities to Khutsong township-based SMMEs who have acquired skills and training in manufacturing. Other employment opportunities will emerge from the reskilled official, and Khutsong youth will be in i) procurement, ii) transport, iii) solar panel installation, iv) grid connection and v) operation and maintenance.

This initiative can effectively address the challenges associated with the impact of electricity insecurity on Khutsong SMME's business operation, thus alleviating poverty, reducing unemployment, and mitigating crime and drug abuse in the township. However, the study outlined significant barriers to successful implementation, notably needing a clear framework for integrating informal township-based SMMEs into the intricate renewable energy landscape. Additionally, challenges in MCLM audit performance pose substantial obstacles to renewable energy integration and the development of Khutsong SMMEs and LED.

5.2. Recommendations.

In order for Merafong City to leverage the REI4P as a catalyst for LED and concurrently facilitate the seamless integration of Khutsong Township-based SMMEs. The following recommendations are made:

1. The MCLM needs to address their audit performance status as per the auditor general's report because it needs to be in an excellent financial position to undertake the REI4P as a massive LED initiative.
2. Enter into REI4P sub-contracting negotiations with Sibanye Gold Mine to encourage the private company to bid and acquire a tender to enter into a sub-contracting agreement with Khutsong SMMEs valued at a minimum of 25% of the state contract as rooftop solar SSEEGs. Thus, agree with the mine via the conditions of Corporate Social Investment (CSI) and Service Level Agreements (SLA) to offer land and storage facilities for the additionally generated solar power.
3. The researcher proposes that the MCLM should initiate collaboration with energy experts to gain insightful perspectives on the existing portable renewable energy power solutions available in the market. Specifically, it is recommended that the municipality compile an energy consumption report for all sectors within Khutsong SMMEs. This comprehensive report aims to assist the municipality in strategically allocating funds to support these SMMEs based on their estimated energy consumption and standard business hours. The primary objective of this initiative is to empower the municipality to offer informed advice and recommendations on portable power solutions tailored to the unique needs of Khutsong SMMEs. This may include but is not limited to, solar-generating kits, cordless rechargeable appliances, and tools. The intention is to provide flexible solutions seamlessly integrated, with or without solar components, catering to the diverse energy needs of the SMMEs operating within the municipality. This multifaceted approach will enhance energy efficiency for Khutsong SMMEs and align with broader sustainability goals. It positions the MCLM as a facilitator of innovative energy solutions, fostering economic growth within the community while promoting environmentally conscious practices.

4. The researcher also recommends that the Merafong City Local Municipality creates a Local Climate Change & Renewable Energy Efficiency Strategy as part of its voluntary commitment to assist local governments in addressing climate change in alignment with the priorities of the SALGA energy summit, namely i) Renewable Energy Development, ii) Local Energy Governance, iii) restructure the current local government electricity service and Business Model. This energy efficiency strategy will then be integrated into the MCLM planning process through their IDP to guarantee that it fosters a collaborative leadership environment, customer focus, operational resilience, and new development opportunities.
5. The researcher recommends strategic amendments to the Integrated Development Plan (IDP) environmental analysis section of the Merafong City Local Municipality (MCLM), incorporating three critical criteria. This inclusion aims to position Merafong City as a leading advocate for sustainable practices that align with global environmental goals. Simultaneously, the municipality's Spatial Development Framework (SDF) should be revised to incorporate guidelines specifically addressing land use management in the context of long-term solar photovoltaic renewable energy planning.

Firstly, the municipality should actively prioritise climate change and sustainable energy within its IDP. Given Merafong City's unique status as a mining town, emphasis should be placed on acknowledging the environmental impact of climate change on the local landscape. The IDP should articulate the municipality's commitment to mitigating global warming effects and outline strategies to achieve this goal.

Secondly, the MCLM should catalogue climate change and sustainable energy projects within its jurisdiction. This involves creating a comprehensive list of projects scheduled to commence within the next five years, differentiating between those led by the municipality in collaboration with private stakeholders and government projects coordinated by relevant departments and entities.

This categorisation is pivotal for the municipality to strategically align itself with ongoing initiatives and plan for future collaborations to pursue developmental and environmental objectives.

Thirdly, the municipality must explore diverse funding options to allocate a budget for implementing renewable energy projects. This criterion necessitates a detailed

examination of the municipality's financial performance and stability. The municipality should assess its revenue collection, income generation from services provided, and financial feasibility for introducing renewable energy (RE) projects. Local funding sources should be considered, including the Local Government Equitable Share (LEGS) grants, municipal operational expenditures, and revenue generated from basic service delivery rates and tariffs.

Additionally, the Merafong City Local Municipality can explore various funding streams recommended by the South African Local Government Association Energy Policy and Legislation Guide (2017: 21). These include the Urban Settlement Development Grant, Integrated City Development Grant, Integrated National Electrification Municipal Programme Grant, Municipal Infrastructure Grant (MIG), and the Energy Efficiency Demand Side Management Grant (EEDSM) (SALGA, 2017, p. 21). Incorporating these criteria into the IDP and SDF will strengthen Merafong City's commitment to sustainable practices and provide a robust foundation for effective planning, collaboration, and financial allocation in the pursuit of renewable energy initiatives.

5.3 Research Contributions.

Local economic development is a subject that has been studied extensively in South Africa and other developmental states within the African continent. What sets this study apart from the literature material consulted is that there needed to be more studies on the role of the REI4P in strategically integrating informal businesses such as Khutsong township-based SMMEs to stimulate LED.

5.4 Knowledge Gaps for Future Research.

This study examines the potential role of South Africa's Renewable Energy Programme in Khutsong Township's economic development within the Western District Municipality. Similar investigations could be conducted in other South African local municipalities. Future research may also explore the health and environmental impacts of Renewable Energy Development Zones (REDZs) with high solar irradiation levels during the initial ten years of implementing solar PV energy projects in township economies.

Reference List.

- Acheampong, A. O., Dzator, J., & Savage, D. A. (2021). Renewable Energy, CO2 Emissions and Economic Growth in Sub-Saharan Africa: Does Institutional Quality Matter? *J. Pol. Model.* 43 (5), 1070–1093. doi:10.1016/j.jpolmod.2021.03.011
- Adhikari, M. (2021). An Economically Sustainable Approach to the Energy Transition in Developing Countries. *The National Bureau of Asian Research* <https://www.nbr.org/publication/an-economically-sustainable-approach-to-the-energy-transition-in-developing-countries/>
- Agwa-Ejon, J.F., & Mbohwa, C. (2015). The impact of research and innovation on SMMEs in Gauteng Province South Africa. doi:<http://hdl.handle.net/10210/14661>
- Akpanaku, E.E., & Asgowa, I.E., (2012). Accountability: A Synthesis. Scientific & Academic Publishing.2(3),164–173. doi:10.5923/j.ijfa.20130203.04
- Ambe, I.M.; Badenhorst-Weiss, J.A. Procurement challenges in the South African public sector. *J. Transp. Supply Chain Manag.* 2012, 6, 243–261. R <https://jtscm.co.za/index.php/jtscm/article/view/63> (accessed on March 30 2020).
- Anna, D., Niklas, A., Antonio, H., & Jose, a. (2014). [What drives the development of renewable energy technologies? Toward a typology for the systemic drivers](https://ideas.repec.org/a/eee/rensus/v38y2014icp834-847.html), *Renewable and Sustainable Energy Reviews*, Elsevier,38(C), Retrieved From <https://ideas.repec.org/a/eee/rensus/v38y2014icp834-847.html>
- Arnoldi, M. (2023, February 15). *PwC expects govt's revenue collection rate to dwindle amid loadshedding*. Creamer Media's Engineering News. https://www.engineeringnews.co.za/article/pwc-expects-govts-revenue-collection-rate-to-dwindle-amid-loadshedding-2023-02-15/rep_id:4136
- Arsenova, M., Wlokas, H. L., Vorotniak, A., Diaz, A., & Jones, V. N. (n.d.). *Local Benefit Sharing in Large-Scale Wind and Solar Projects. Discussion Paper June 2019*. 2019 International Finance Corporation. https://www.commddev.org/wp-content/uploads/2019/06/IFC-LargeScaleWindSolar_Web.pdf
- Basu, K., & Palazzo, G. (2008). Corporate Social Responsibility: A Process Model of Sensemaking. *The Academy of Management Review*, 33(1), 122–136. <https://doi.org/10.2307/20159379>
- Bazeley, P. (2016). Mixed or merged? Integration as the real challenge for mixed methods. *Qualitative Research in Organizations and Management: An International Journal*.
- Becker, S., Bryman, A., & Ferguson, H. (Eds.). (2012). *Understanding research for social policy and social work 2E: themes, methods and approaches*. Policy Press.
- Bhorat, H., Asmal, Z., Lilenstein, K. and van der Zee, K. (2018). “SMMEs in South Africa: Understanding the Constraints on Growth and Performance”. Development Policy Research Unit Working Paper 201802. DPRU, University of Cape Town.
- Bernstein, N.A., ((2019) *Renewable Energy Transitions in Cape Town Opportunities for Cape Town to become a pioneer City for Renewable Energy Transition in South Africa*. (Master's Thesis). Libera Università Internazionale Degli Studi Sociali. Retrieved 28 August, 2022, from https://www.ie-ei.eu/Ressources/FCK/image/RECHERCHE/Theses_2019/Bernstein_Thesis%20.pdf

- Bhuiyan, M. A., Zhang, Q., Khare, V., Mikhaylov, A., Pinter, G., & Huang, X. (2022). Renewable Energy Consumption and Economic Growth Nexus—A Systematic Literature Review. *Frontiers in Environmental Science*, 10. <https://www.frontiersin.org/articles/10.3389/fenvs.2022.878394>
- Braun, v. and Clarke, V. (2014). *Successful Qualitative research is a practical guide for beginners*. Singapore: Sage Publications.
- Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative research in sport, exercise and health*, 11(4), 589–597.
- Bressand, A., (2012). The Changed Geopolitics of Energy and Climate and the Challenge for Europe. A geopolitical and European perspective on the triple agenda of competition, energy security and sustainability Retrieved from https://www.clingendaelenergy.com/inc/upload/files/The_changed_geopolitics_of_energy_and_climate_bressand.pdf
- Botha, T. (2019). *The impact of 'load-shedding' within the Nelson Mandela Bay restaurant industry* (Honours Thesis) [The Independent Institute of Education] Available from <http://iiespace.iie.ac.za:80/handle/11622/323>
- Bruwer, J.-P., Lombard, M., Smit, Y., & Katrodia, A. (2019). The Influence of Excise Taxation Levied on Product Sales on the Financial Sustainability of South African Tobacco-and-Alcohol-Selling Small, Medium and Micro Enterprise. *Expert Journal of Business and Management*, 7(1). <https://business.expertjournals.com/23446781-708/>
- Caiden, G.E., (1991). What Really Is Public Maladministration? *Public Administration Review* 51, 486–493. doi: <https://doi.org/10.2307/976599>
- Castleberry, A., and Nolen, A., (2018). Thematic analysis of qualitative research data: Is it as easy as it sounds? *Currents in Pharmacy Teaching and Learning*, 10(6) doi: <https://doi.org/10.1016/j.cptl.2018.03.019>.2017
- Chadwick, E.A., (2017). The SAGE Encyclopaedia of Communication Research Methods. Allen, M., (Ed.), "Population/Sample" (pp.1284–1286). Thousand Oaks, Sage Publications. Retrieved 29 March, 2021, from <https://methods.sagepub.com/reference/the-sage-encyclopedia-of-communication-research-methods/i10949.xml#:~:text=Having%20a%20sample%20that%20is,sample%20to%20the%20target%20population>.
- Chang, R.D., Zuo,J., Zhen-Yu,Z.,George,Z.,Xiao-Long, G.,&Soebarto,V.,(2017). [Evolving theories of sustainability and firms: History, future directions and implications for renewable energy research](#), *Renewable and Sustainable Energy Reviews*, Elsevier, vol. 72(C), pages 48-56.doi:<https://doi.org/10.1016/j.rser.2017.01.029>
- Cilliers, I. (2022, July 6). DA Merafong Constituency Head. *Merafong is trying to hide its adverse audit opinion from the ratepayer – why?* DA Gauteng. Retrieved 28 March , 2023, from <https://dagauteng.org.za/2022/07/merafong-is-trying-to-hide-its-adverse-audit-opinion-from-the-ratepayer-why>
- Cissokho, L., & Seck, A. (n.d.). *Electric Power Outages and the Productivity of Small and Medium Enterprises in Senegal* By. 28.
- Cohen, D., (2010). Key Issues In Local Economic Development In South Africa And A Potential Role For SALGA. [Retrived 08 September 2022, from](#)

<https://www.salga.org.za/Documents/Knowledge%20Hub/SALGA%20Position%20Papers/SALGA-Position-Paper-on-Local-Economic-Development.pdf>

Creswell, J.W., (2003). *Designing and conducting mixed methods*. Thousand Oaks London Sage.

Crowe, S., Cresswell, K., & Robertson, A. *et al.* (2011). The case study approach. *BMC Med Res Methodol* 11, 100 Retrieved 28 March,2021, from. <https://doi.org/10.1186/1471-2288-11-100>

Da Vinci Institute. (2016). Da Vinci Research Guide for Postgraduates. Retrieved 28 March,2021, from <http://efundi.nwu.ac.za/access/content/group/4251e741-a8f6-403c-a695-6e0700aa8484/The%20Da%20Vinci%20Research%20Guide%20-%20Msc%20%20PhD.pdf>

Darlington, M., Nyuke, S., & Khanyile, S. (2022). *Electricity interruptions in the GCR* (Map of the Month) [Map of the Month]. Gauteng City-Region Observatory. <https://doi.org/10.36634/CSNP9525>

Darmani, A., Arvidsson, N., Hidalgo, A., & Albors, J. (2014). What drives the development of renewable energy technologies? Toward a typology for the systemic drivers. *Renewable and Sustainable Energy Reviews*, 38(C), 834–847.

Davidson,K., (2021) South African Local Government Association (SALGA) Energy Efficiency (E.E.) & Renewable Energy (RE) Strategy Guide. Retrieved 06 September, 2022, from <https://www.cityenergy.org.za/wp-content/uploads/2021/04/SALGA-EE-RE-Strategy-Guide-Digital-high-res.pdf>

Department of Mineral Resources and Energy (2021, May 18). Minister Gwede Mantashe: Mineral Resource and Energy Department budget vote speech for the 2021/22 Financial year *South African Government*. Retrieved from <https://www.gov.za/speeches/minister-gwede-mantashe-mineral-resources-and-energy-dept-budget-vote-202122-18-may-2021>

Diggs, S., & Roman, A., (2012). Understanding and Tracing Accountability in the Public Procurement Process: Interpretations, Performance Measurements, and the Possibility of Developing Public-Private Partnerships. *Public Performance & Management Review*. 36. 289.doi:[10.2753/PMR1530-9576360207](https://doi.org/10.2753/PMR1530-9576360207)

Eberhard, A. and Naude, R. (2017). The South African Renewable Energy IPP Procurement Programme Review, Lessons Learned & Proposals to Reduce Transaction Costs retrieved from https://www.gsb.uct.ac.za/files/EberhardNaude_REIPPPReview_2017_1_1.pdf

Eberhard, A., (2001). Competition and regulation in the electricity supply industry in South Africa. Trade and Industrial policy strategies:2001 Annual Forum, Misty Hills, Muldersdrift, CT, p. 10-12 September. Retrieved from [http://www.tips.org.za/files/Competition and Regulation in the Electricity Supply Industry in South Africa.pdf](http://www.tips.org.za/files/Competition_and_Regulation_in_the_Electricity_Supply_Industry_in_South_Africa.pdf)

Ebneyamini, S., & Sadeghi Moghadam, M. R. (2018). Toward Developing a Framework for Conducting Case Study Research. *International Journal of Qualitative Methods*, 17(1). <https://doi.org/10.1177/1609406918817954>

Elkatawneh, H., (2016). The Five Qualitative Approaches: Problem, Purpose, and Questions/The Role of Theory in the Five Qualitative Approaches/Comparative Case Study. *SSRN Electronic Journal*. 10.2139/ssrn.2761327.

- Eskom rolling power cuts hurting small businesses. (2019, March 25) *IOL*. Retrieved from <https://www.iol.co.za/business-report/economy/eskom-rolling-powercuts-hurting-small-businesses-20071333>
- Esser, I., & Dekker, A. (2008). Dynamics of corporate governance in South Africa: broad-based black economic empowerment and the enhancement of good corporate governance principles. *Journal of International Commercial Law and Technology*, 3(3), 157-169
- Etikan, I., Musa, S.A., and Alkassim, R.S., (2016) Comparison of Convenience Sampling and Purposive Sampling. *American Journal of Theoretical and Applied Statistics*. 5(1), 2016, pp. 1-4. Retrieved 30 June, 2022, from https://d1wqtxts1xzle7.cloudfront.net/55796997/Comparison_Convenience_and_Purposive_Sampling-2016_4p-with-cover-page-v2.pdf?Expires=1663877211&Signature=HxLfU0LIAS~dA-Wfe3exJhKlwZptWHBM5HU3b9QMj8zt0f85Uf8-h5FyNaeZCYG-7liNFFI8kWB6PgnOYbRrNMhSejqLnkVn1V6CNtnRENwKiyveSe7ZFipZli~4sXAh-mJskUMhJH3~oFbLUtdcAtVT6TfiLPxOFLtA65XIeQTEIST9bQIYIb7LI91KJGK0SbpE1ocYqQCMvymTDug07yitehZLCYF-i8Q~jGY69FyAR2PQHn9smVTyw8GkCbU-P2GqyKuXQoUqquY77y-LbjmXnp3llb39H4K25kLF0mKEV3S8qL0yRL7XEwgKofADSBb6XSulzNDwKX~-Vm3UA_&Key-Pair-Id=APKAJLOHF5GGSLRBV4ZA
- Filipova, A. and Boule, M. 2019. Key Lessons on Institutional Arrangements for Managing the Restructuring of Power Utilities. https://www.gsb.uct.ac.za/files/Key_Lessons_on_Power_Sector_Restructuring_Final.pdf?platform=hootsuite
- Fischer, D. (2017). *Strategic environmental assessment (SEA) supporting the transition to renewable energy in South Africa* (Order No. 28280575). Available from ProQuest Dissertations & Theses Global. (2485495035).
- Fourie, D. & Malan, Cornel. (2020). Public Procurement in the South African Economy: Addressing the Systemic Issues. *Sustainability*. Retrieved 20 October, 2021, from https://www.researchgate.net/publication/346323184_Public_Procurement_in_the_South_African_Economy_Addressing_the_Systemic_Issues
- Fourie, R. (2021). *South African Photovoltaic Industry Association (SAPIVA) Solar P.V. Industry Jobs Report*. Retrived 26 June, 2022, from <https://www.sapvia.org.za/wp-content/uploads/2021/05/SAPVIA-PV-Industry-Jobs-Study-Report-COMBINED.pdf>
- Freeman, R.E., (2017). Five Challenges to Stakeholder Theory: A Report on Research in Progress", *Stakeholder Management (Business and Society)* 360) (1), 1–20.doi: <https://doi.org/10.1108/S2514-175920170000001>
- Freeman, R.E., Kujala, J., Sachs, S., Stutz, C. (2017). Stakeholder Engagement: Practicing the Ideas of Stakeholder Theory. In: Freeman, R., Kujala, J., Sachs, S. (eds) *Stakeholder Engagement: Clinical Research Cases*. *Issues in Business Ethics*, vol 46. Springer, Cham. https://doi.org/10.1007/978-3-319-62785-4_1
- Gauteng Growth and Development Agency. (2021, October 29). ALL YOU NEED TO KNOW ABOUT THE FIVE ECONOMIC CORRIDORS IN GAUTENG. *Gauteng Growth and Development Agency*. Retrieved 18 February , 2023, <https://ggda.co.za/the-gauteng-city-regions-space-and-the-economy-will-be-configured-into-five-development-corridors-that-will-have-distinct-industries-and-different-comparative-advantages/>

Gauteng Township Economic Development Act, (2022). Act 2 of 2022, Gauteng Provincial Gazette no. 174 (2022). <https://lawlibrary.org.za/akn/za-gp/act/2022/2/eng@2022-05-26/source>

Gauteng Township Economic Revitalization strategy ((2018) 2014).-2019 Retrieved 26 August , 2021, from <https://www.gep.co.za/wp-content/uploads/2018/12/Gauteng-Township-Economy-Revitalisation-Strategy-2014-2019.pdf>

Gauteng's five development corridors | City Press. (n.d.). Retrieved 14 February, 2023, from <https://www.news24.com/citypress/sponsored/gautengs-five-development-corridors-20191116>

Gauteng-Township-Economy-Revitalisation-Strategy-2014-2019. Retrieved 26 August, 2021, from <https://www.gep.co.za/wp-content/uploads/2018/12/Gauteng-Township-Economy-Revitalisation-Strategy-2014-2019.pdf>

Glazewski, J., (2005). The Legal Framework for Renewable Energy in South Africa. Retrieved from https://www.un.org/esa/sustdev/sdissues/energy/op/parliamentarian_forum/glazewski_re_sa.pdf

Solargis(cartographer).(2022).Global Solar Atlas Gauteng West Rand District Municipality [Map].Retrieved from <https://globalsolaratlas.info/map?s=-26.361436,27.401916&m=site&c=-26.361436,27.401916,11>

World Bank Group (cartographer).(2023).Global Solar Atlas Merafong City Local Municipality[Map].Retrieved from <https://globalsolaratlas.info/map?c=8.524994,-81.085764,10&a=-81.345078,8.783118,-81.067459,8.810279,-80.899668,8.867611,-80.82645,8.18207,-80.951531,8.215318,-81.061358,8.21834,-81.107119,8.254607,-81.155931,8.490262,-81.186439,8.550664,-81.27186,8.535564,-81.338977,8.565762,-81.345078,8.783118&s=-26.361436,27.401916&m=site&pv=small,0,29,1>

Goldberg, A., (2015). *The economic impact of loadshedding: The case of South African retailer (Master's thesis)* Retrieved 20 February, 2021, from https://repository.up.ac.za/bitstream/handle/2263/52398/Goldberg_Economic_2015.pdf?sequence=1&isAllowed=y

Google Earth. (n.d.).[Carletonville Demercation Map] Retrieved 23 May 2023, from <https://earth.google.com/web/search/carletonville/@-26.38564285,27.4054195,1590.46696874a,33320.3405399d,35y,0h,0t,0r/data=CngaThJICiUweDFIOTVjNTAyZTA5YTYyOTc6MHgzYTMxZDEyMWIxOWE0ZDExGQqJD0eyZjrAIUYRCCqZYjtAKq1jYXJsZXRvbnZpbGxIGAlqASImCiQJh95AtzEyOsARo-NIYJ1qOsAZqYxhxG5cO0AhQWES6SMwO0A6AwoBMA>

Google Earth. (n.d.).[Khutsong South Township Demercation Map] Retrieved 23 May 2023, from https://earth.google.com/web/search/Khutsong/@-26.33002195,27.31630595,1477.8005325a,10417.61612057d,35y,0h,45t,0r/data=CnMaSRJDCiUweDFIOTVkyZhhZWl4MTM4ZDk6MHhIODdlMTBmYzA1M2YwODhhGUEeCxuvVDrAIdmRj4JMUTtAKghLaHV0c29uZxgCIAEiJgokCfYnyT3MQzrAEXQgxZlgYTrAGYwVHyrWztAlZW_TpmXOztAKAI6AwoBMA

- Google Earth. (n.d.).[Khutsong South Township Demarcation Map] Retrieved 23 May 2023, from <https://earth.google.com/web/search/Khutsong+South,+Carletonville/@-26.349662,27.3264273,1482.12715027a,4960.41988549d,35y,0h,45t,0r/data=CogBGI4SWAoIMHgxZTk1ZGI2MmNiNGZiYml3OjB4M2ExMzU4OWQzNGlwMzYyNjkwNnhwolk6wCG6KvXRTIQ7QCodS2h1dHNvbmcgU291dGgsIENhcmxldG9udmlsbGUYAiABliYKJAnqs-7F3kU6wBHU1g8nqIE6wBmtPG2NtL07QCH0ezbkyik7QCgCOgMKATA>
- Govender, J., & Reddy, P.S., (2015). A review of local government experience in South Africa Successes and failures. Retrieved 20 February, 2022, from https://repository.up.ac.za/bitstream/handle/2263/58179/Govender_Review_2015.pdf?sequence=1&isAllowed=y
- Hafner, M., & Tagliapietra, S. (2020). The Global Energy Transition: A Review of the Existing Literature. In: Hafner, M., Tagliapietra, S. (eds) The Geopolitics of the Global Energy Transition. Lecture Notes in Energy, vol 73. Springer, Cham. https://doi.org/10.1007/978-3-030-39066-2_1
- Hammam, J., Johansson, S., & Persson, H., (2013). Potential for Solar Energy on Rooftops in the Municipality of Uppsala. Retrieved 20 January, 2022, from <https://www.diva-portal.org/smash/get/diva2:627870/FULLTEXT01.pdf>
- Hansapl, J., (2021, November 10). *COP26: South Africa to receive \$8.5bn to stop using coal*. The Africa Report.Com. Retrieved February 20, 2021, from <https://www.theafricareport.com/143773/cop26-south-africa-to-receive-8-5bn-to-stop-using-coal/>
- Harpe, S. Public Procurement Law: A Comparative Analysis. Ph.D. Thesis, University of South Africa, Pretoria, South Africa, 2009; pp. I–iii.
- Hlalutye, T. (2018). Procurement challenges faced by Eskom contractors during the tender stage. (Master's Thesis) Retrieved 20 February, 2022, from http://vital.seals.ac.za:8080/vital/access/manager/Repository/vital:30913?site_name=GlobalView&view=null&f0=sm_creator%3A%22Hlalutye%2C+Thandiwe%22&sort=null
- Honiball, H., (2013) Legal Framework for the Promotion of Renewable Energy in South Africa: a Critical Analysis Master's Thesis Retrieved 23 February, 2022, from https://dspace.nwu.ac.za/bitstream/handle/10394/11724/Haniball_H.pdf?sequence=1
- Hsu, A., Rosengarten, C., Weinfurter, A., Xie, Y., Musolino, E., & Murdock, H. E. (2017). Renewable energy and energy efficiency in developing countries: contributions to reducing global emissions-third report. Retrieved 23 February, 2022, from <https://stg-wedocs.unep.org/handle/20.500.11822/22149>
- Huang, X., Hayashi, K., Matsumoto, T., Tao, L., Huang, Y., & Tomino, Y. (2022). Estimation of Rooftop Solar Power Potential by Comparing Solar Radiation Data and Remote Sensing Data—A Case Study in Aichi, Japan. Remote Sensing, 14(7), Article 7. <https://doi.org/10.3390/rs14071742>
- Integrated Energy Plan for The Republic of South Africa*, Department of Minerals and Energy (2003). Retrieved 06 March, 2021, from https://www.gov.za/sites/default/files/gcis_document/201409/dmeintegratedenergyplan190320030.pdf
- Integrated Resource Plan (IRP2019)*, Department of Mineral Resources and Energy (2019). Retrieved 06 March, 2021, from <https://www.energy.gov.za/IRP/2019/IRP-2019.pdf>

- International Energy Agency (2013) World Energy Outlook (WEO) Retrieved 15 September, 2021, from <https://iea.blob.core.windows.net/assets/a22dedb8-c2c3-448c-b104-051236618b38/WEO2013.pdf>
- International Energy Agency *Skills Development and Inclusivity for Clean Energy Transitions*. (2022). <https://iea.blob.core.windows.net/assets/953c5393-2c5b-4746-bf8e-016332380221/Skillsdevelopmentandinclusivityforcleanenergytransitions.pdf>
- International Labour Organization. (2018). *Skills for Green Jobs in South Africa*. Retrieved 26 December, 2022, from https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---ifp_skills/documents/publication/wcms_706955.pdf
- IRENA (2018), Global Energy Transformation: A roadmap to 2050, International Renewable Energy Agency, Abu Dhabi. Retrieved 23 February , 2022, from <https://www.irena.org/publications/2018/Apr/Global-Energy-Transition-A-Roadmap-to-2050>
- IRENA (2021) The Renewable Energy Transition in Africa. Retrieved 24 February, 2022, from <https://www.irena.org/publications/2021/March/The-Renewable-Energy-Transition-in-Africa>
- Jalilian, H., Kirkpatrick, C., & Parker, D. (2007). The impact of regulation on economic growth in developing countries: A cross-country analysis. *World development*, 35(1), 87-103.
- Jegade, O. (2021). Backdrop of Research and Innovation in South Africa: Implications for Fourth Industrial Revolution. European Conference on Innovation and Entrepreneurship, 452.
- Jenniches, S. (2018). Assessing the Regional Economic Impacts of Renewable Energy Sources - A Literature Review. *Renew. Sustain. Energy. Rev.* 93 (October), 35–51. doi:10.1016/j.rser.2018.05.008
- Kelman, S., (2008). Discussion Paper on Procurement Issues in South Africa That Affect Growth and Development, CID Working Papers 171, Centre for International Development at Harvard University. Retrieved 20 February, 2021, from <https://ideas.repec.org/p/cid/wpfacu/171.html>
- Kiama, G. P. (2014). 'Factors affecting implementation of public procurement act in SACCO societies in Kenya'. *International Journal of Academic research in Business and Social Science*, 4 (2), 169–194. doi: [10.6007/IJARBS/v4-i2/614](https://doi.org/10.6007/IJARBS/v4-i2/614)
- Kiger, E.M., and Varpio, L., (2020). Thematic analysis of qualitative data: AMEE Guide No. 131, Medical Teacher, doi <https://doi.org/10.1080/0142159X.2020.1755030>.
- Kitzinger, C., & Willmott, J. (2002). 'The thief of womanhood': Women's experience of Polycystic Ovarian Syndrome. *Social Science & Medicine*, 54(3), 349-361.
- Koppell, J.G.S. 2005. Pathologies of Accountability: ICANN and the Challenge of “Multiple Accountabilities Disorder.” *Journal on Public Administration Review*, 65(1). (Abstract). Retrieved 11 August, 2019, from https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1540-6210.2005.00434.x?casa_token=xU-c9-tE-n8AAAAA:i5GPt9oi5oleeVyLmIVhMmrf2FR9X7aJWez5eAJpLqWXK1dManhh9fTbAhEFnHDzIHtPID1NnWA8DA
- Kriel, G., (202, March 04) Analysing the state of SMMEs in a stagnant economy. *Fin24*. Retrieved 27 February, 2022, from <https://www.smallbusinessinstitute.co.za/2020/03/10/fin24-analysing-the-state-of-smmes-in-a-stagnant-economy/>

- Krikpatrick, C., Parker, D., & Zhang, Y., (2007). Price and Profit Regulation in Developing and Transition Economies: A Survey of the Regulators. *Public Money and Management Journal*, 25(2), 99-105.
- Kumar, R. (2014). *Research methodology a step-by-step guide for beginners*. Singapore. Sage.
- Kurniawan, T., Muslim, M.A., Sakapurnama, E., (2018). Regulatory impact assessment and its challenges: An empirical analysis from Indonesia, *Kasetsart Journal of Social Sciences*, Volume 39(1) 105–108. doi: <https://doi.org/10.1016/j.kjss.2017.12.004>
- Lane, J. E., (2006). *Public administration & public management: the principal-agent perspective*. Routledge.
- Lang, J. (2019). *How load shedding hits SMEs—And what they can do about it*. (n.d.). Fin24. Retrieved 20 February, 2022, from <https://www.news24.com/Fin24/how-load-shedding-hits-smes-and-what-they-can-do-about-it-20190218> 18 Feb 2019
- Laurie, S., van Zyl, H., & Barbour, T. (2019). Strategic Environmental Assessment For The Expansion Of Electricity Grid Infrastructure In South Africa. Socio-Economic Assessment Specialist Report. Retrieved 14 February, 2023, from https://sahris.sahra.org.za/sites/default/files/additionaldocs/3.7.%20Socio-Economic_EGI_Final_080319.pdf
- Lavaa, A. (n.d.). *Everything You Need to Know About Monocrystalline Solar Panel*. Linquip Technews. Retrieved 21 February, 2023, from <https://www.linquip.com/blog/what-is-a-monocrystalline-solar-panel/>
- Lawal, K. (2021). Law, Policy, and the Development of Renewable Energy for Electricity: A Case for a Renewable Energy Law in Nigeria. *International Journal of Legal Information*, 49(1), 3–15. Doi: <https://doi.org/10.1017/iji.2021.7>
- Lecker M. J. (2011). When Corporate Leaders Behave Badly. *Human Resource Management*. Polish Academy of Sciences and Institute of Labor and Social Studies 6/2011 (83), 38–49.
- Linares, P., & Rey, L. (2013). The costs of electricity interruptions in Spain. Are we sending the right signals? *Energy Policy*, 61, 751–760. <https://doi.org/10.1016/j.enpol.2013.05.083>
- Local Government; Municipal Systems Act, 2000.*, The Presidency (2000). Retrieved 05 September ,2022, from https://www.energy.gov.za/files/policies/act_municipalsystem_32of2000.pdf
- Lombardi P, Gruenig M (eds) (2016). *Low-carbon energy security from a European perspective*. Academic Press
- Louw, A. (2023, February 9). Merafong' s finances in shambles. *Carletonville Herald*. Retrieved 10 January, 2023, <https://carletonvilleherald.com/66913/merafongs-finances-in-shambles/>
- Magubane, (2019). Magubane, others warn about load-shedding risk. *Engineering news*, August 21. Retrieved 12 September ,2019, from <https://www.engineeringnews.co.za/article/magubane-others-warn-about-load-shedding-risk-2019-08-21>
- Makarov I. A., Chen H. Y., Paltsev S. (2017). "Finding Itself in the Post-Paris World: Russia in the New Global Energy Landscape", MIT Centre for Energy and Environmental Policy Research, No. WP-2017-022, Joint Program Report Series Report 324, December 2017

- Makhathini, D.I., (2019). Rooftop solar photo voltaic potential: Rand Water as case study
Dissertation submitted in fulfilment of the requirements for the degree Master of Engineering
in Development and Management Engineering at the North-West University. Retrieved
February 20, 2022, from
<https://repository.nwu.ac.za/bitstream/handle/10394/34142/7.1.11.7.4%20Makhathini%20DI%2026560720.pdf?sequence=1&isAllowed=y>
- Makhdoom, T. (2017). EFFECTS OF LOADSHEDDING ON RETAIL BUSINESS: A GLIMPSE
FROM HYDERABAD, PAKISTAN. 51. 166–177. Retrieved 20 February, 2022, from
https://www.researchgate.net/publication/326804749_EFFECTS_OF_LOADSHEDDING_ON_RETAIL_BUSINESS_A_GLIMPSE_FROM_HYDERABAD_PAKISTAN
- Maluleke, T. (2020). *Report of the auditor—General to the provincial legislature for the Merafong City Local Municipality*. Retrieved 05 January, 2023, from
https://lg.treasury.gov.za/supportingdocs/GT484/GT484_Audit%20Report_2020_Y_20220302T122348Z_5039.pdf
- Mamdani, M. (1996). Citizen Subject. In *Citizen Subject: Introduction*. Princeton: Princeton University Press.
- Mararakanye, N., & Kritzinger, K., Steyn, A., & Rix, A.J., (2018). Identifying the rooftop PV potential of residential, industrial and commercial areas in South Africa. Retrieved 24 February, 2022, from
https://www.researchgate.net/publication/327573945_Identifying_the_rooftop_PV_potential_of_residential_industrial_and_commercial_areas_in_South_Africa
- Masebinu, R. O., & Kambule, N. (2022). Electricity consumption data of a middle-income household in Gauteng, South Africa: Pre and Post COVID-19 lockdown (2019-2021). *Data in Brief*, 43, 108341. <https://doi.org/10.1016/j.dib.2022.108341>
- Matebese-Notshulwana, Koliswa. (2021). Weak Procurement Practices and the Challenges of Service Delivery in South Africa. Retrieved 21 February, 2022, from
https://www.researchgate.net/publication/349437130_Weak_Procurement_Practices_and_the_Challenges_of_Service_Delivery_in_South_Africa
- Mbanjwa, T., (2017). *An analysis of electricity theft: The case study of KwaXimba in eThekweni, KwaZulu-Natal* (Master's Thesis) Retrieved 20 February, 2022, from
https://researchspace.ukzn.ac.za/bitstream/handle/10413/16105/Mbanjwa_Thobile_2017.pdf?sequence=1&isAllowed=y
- Mbembe, A. (2001). Of Commandment. In *on the Postcolony* (pp. 24–45). California:
- Mbomvu, L., Hlongwane, I., Nxazonke, N.P., I Qayi, Z., & Bruwer, J.P., (2021). Load Shedding and its Influence on South African Small, Medium and Micro Enterprise Profitability, Liquidity, Efficiency and Solvency. doi <http://dx.doi.org/10.2139/ssrn.383151>
- Mehling M., van Asselt H., Das K., Droege S., Verkuijl C. (2017), “Designing Border Carbon Adjustments for Enhanced Climate Action”, *Climate Strategies*, December 2017. Retrieved 28 September, 2021 from https://climatestrategies.org/wp-content/uploads/2017/12/CS_report-Dec-2017-4.pdf
- Merafong Local Municipality Draft Integrated Development Plan (2022). -2023.
- Miles, M. B., Huberman, A. M., & Saldaña, J. 4th Edition (2020). *Qualitative data analysis: A methods sourcebook*. Sage publications.

- Mineral Resource and Energy Department budget vote speech for the 2021/22 Financial. (2021, May 18). *Minister Gwede Mantashe: Mineral Resource and Energy Department budget vote speech for the 2021/22 Financial*. South African Government. Retrieved 20 April, 2021, from <https://www.gov.za/speeches/minister-gwede-mantashe-mineral-resources-and-energy-dept-budget-vote-202122-18-may-2021>
- Mkhize, M., Radmore, J., Scrimgeour, I., & Raw, B. (2020). *Utility-Scale Renewable Energy-2020 Market Intelligence Report -GreenCape*. Retrieved 20 March,2022, from https://green-cape.co.za/assets/RENEWABLE_ENERGY_MIR_20200330_WEB.pdf
- Mkhize, N.I., & Ajam, T. (2006). The new budgeting approach in South Africa: a critical assessment. Retrieved March 29, 2021, from <https://journals.co.za/doi/10.10520/EJC51484>
- Mokoena, S. K. (2019). The Role of Local Economic Development on Small, Medium and Micro Enterprises. *Acta Universitatis Danubius. Administratio*, 11(1), Article 1. <https://dj.univ-danubius.ro/index.php/AUDA/article/view/136>
- Scholtz, L.,Mulaudzi, K., Kritzinger, k.,Mabaso, M.,& Forder, S., (2017).WWF, (2017). Renewable Energy: Facts and Futures. Retrieved 25 February,2022, from https://www.crses.sun.ac.za/files/research/publications/popular-media-and-policy-brief/WWF_Energy%20Facts%20and%20Futures_Final%20Version.pdf
- South Africa. Department of Small Business Development .(2023,14 April) Notice on The Draft South African Smmes And Co-Operatives Funding Policy. (Notice 3353 of 2023). *Government Gazzette*, 48483,pp 655-695.
- Motsiri, P.M. (2009). Public Sector Procurement as a strategic tool for black economic empowerment at Sedibeng District Municipality. Mini-Dissertation: North West University. Retrieved 23 February, 20222, from <https://repository.globethics.net/handle/20.500.12424/442881>
- Mukwarami, S., Mukwarami, J., and Tengeh, R.K., (2020). Local economic development and small business failure: the case of a local municipality in South Africa *International Journal of Business and Globalisation*, 25(4) https://www.researchgate.net/publication/328335380_Local_economic_development_and_small_business_failure_the_case_of_a_local_municipality_in_South_Africa
- Municipal Finance Management Act, 2003.*, The Presidency Retrieved 21 March, 2022, from https://www.gov.za/sites/default/files/gcis_document/201409/a56-03.pdf
- Murombo, T. (2022). Regulatory Imperatives for Renewable Energy: South African Perspectives. *Journal of African Law*, 66(1), 97–122. Doi: <https://doi.org/10.1017/S0021855321000206>
- Myers, C., (2017). The puzzle of procurement - the Preferential Procurement Policy Framework Act and Regulations. 2(10) *Sabinet African Journals* <https://journals.co.za/doi/10.10520/EJC-64e67e3a5>
- National Development Plan 2030 Our Future Make it Work Executive Summary*. (n.d.). <https://www.gov.za/sites/default/files/Executive%20Summary-NDP%202030%20-%20Our%20future%20-%20make%20it%20work.pdf>
- National Energy Act 34 of 2008*, THE PRESIDENCY (2008). Retrieved 20 March, 2022, from https://www.gov.za/sites/default/files/gcis_document/201409/316381263.pdf

- Newbery, D. & Eberhard, A. (2008). *South African Network Infrastructure Review* (Doctoral thesis) Retrieved 20 March, 2021, from <https://www.gsb.uct.ac.za/files/SAElectricityPaper08.pdf>
- News, E. (n.d.). *Merafong municipality working with Eskom to repay R700m in debt*. Retrieved 20 February, 2023, from <https://ewn.co.za/2022/02/18/merafong-municipality-working-with-eskom-to-repay-r700m-in-debt>
- Niekerk, S. van (2019, 04 Jul.) OP-ED: A different Eskom: Achieving a just energy
- Nijaki, K.L., & Worrel, G., (2012). "Procurement for sustainable local economic development", *International Journal of Public Sector Management*, Vol. 25 No. 2, pp. 133–153. <https://doi.org/10.1108/09513551211223785>
- Niselow, T. (2018, July 24) 7 reasons Eskom's finances are at a 'tipping point', *Fin24*. Retrieved 25 April, 2021, from <https://www.news24.com/fin24/7-reasons-eskoms-finances-are-at-a-tipping-point-20180724-2>
- Niselow, T. (2019, March 24). Sunday Read: Load shedding through the years and how Eskom has struggled to keep the lights on. *Fin24*. Retrieved 25 April, 2021, from <https://www.news24.com/fin24/economy/eskom/sunday-read-load-shedding-through-the-years-and-how-eskom-has-struggled-to-keep-the-lights-on-20190324>
- Niselow, T. (n.d.). *7 reasons Eskom's finances are at a 'tipping point'*. Business. Retrieved 10 July, 2023, from <https://www.news24.com/fin24/7-reasons-eskoms-finances-are-at-a-tipping-point-20180724-2>
- Niselow, T., (2019, March 24). *Sunday Read: Load shedding through the years and how Eskom has struggled to keep the lights on* | *Fin24*. Retrieved 10 July, 2021, from <https://www.news24.com/fin24/Economy/Eskom/sunday-read-load-shedding-through-the-years-and-how-eskom-has-struggled-to-keep-the-lights-on-20190324>
- Nokele, K., & Shopola, M., (2022). Procurement Dynamics and Threats in South African Local Government Introduction and Context of The Study. 221–231. https://www.researchgate.net/publication/358699170_Procurement_Dynamics_and_Threats_in_South_African_Local_Government_Introduction_and_Context_of_The_Study/citation/download
- Ntsoane, M., (2017). Rooftop Solar P.V. Potential Assessment in the City of Johannesburg Master of Philosophy in Sustainable Development in the Faculty of Economic and Management Sciences at Stellenbosch University. <https://core.ac.uk/download/pdf/188224035.pdf>
- Nyawo, B. (2019). *A viability study of independent power producers in the South African electricity supply market - A case study of Northern Cape Province*. Engineering and the Built Environment, Department of Mechanical Engineering. Retrieved 20 October, 2020 from <http://hdl.handle.net/11427/30145>
- Nzimakwe, T.I., & Biyela, A.C., (2021). Exploring the Procurement Challenges in the South African Public Sector. In: Dorasamy, N., Fagbadebo, O. (eds) *Public Procurement, Corruption and the Crisis of Governance in Africa*. Palgrave Macmillan, Cham Retrieved 20 October ,2020. https://doi.org/10.1007/978-3-030-63857-3_5

- Odhiambo, W.; Kamau, P. Public procurement: Lessons from Kenya, Tanzania and Uganda. In OECD Development Centre: Working Paper No. 208; OECD iLibrary: Paris, France, 2003; pp. 1–20. Retrieved October 15, 2020, from <https://doi.org/10.1787/804363300553>
- OECD (2015), G20/OECD Principles of Corporate Governance, OECD Publishing, Paris. Retrieved 15 October, 2020, from <http://dx.doi.org/10.1787/9789264236882-en>
- OECD (2020), Regulatory Impact Assessment, OECD Best Practice Principles for Regulatory Policy, OECD Publishing, Paris, <https://doi.org/10.1787/7a9638cb-en>.
- OECD Principles For Integrity in Public Procurement (2009) Retrieved 15 October, 2020, from <https://www.oecd.org/gov/ethics/48994520.pdf>
- OECD, United Nations Economic Commission for Africa and African Development Bank. (2022). *Africa's Urbanisation Dynamics 2022 The Economic Power of Africa's Cities*. Retrieved 15 October, 2020, from https://www.oecd-ilibrary.org/development/africa-s-urbanisation-dynamics-2022_3834ed5b-en
- Okunlola, A., Jacobs, D., Ntuli, N., Fourie, R., Borbonus, S., Nagel, L., & Helgenberger, S., (2019), *COBENEFIT STUDY Future skills and job creation through renewable energy in South Africa Assessing the co-benefits of decarbonising the power sector Executive report*. Retrieved 16 December, 2022, from <https://tips.org.za/just-transition/item/4095-future-skills-and-job-creation-through-renewable-energy-in-south-africa-assessing-the-co-benefits-of-decarbonising-the-power-sector>
- Pasieczny, J. 2017. Organisational Pathologies Under Conditions of Economic Downswing Economics And Culture 14(1). Retrieved 19 April, 2019, from <https://www.degruyter.com/downloadpdf/j/jec.2017.14.issue-1/jec-2017-0002/jec-2017-0002.pdf>
- Peberdy, S., Harrison, P., and Dinath, Y., (2017). *GCRO Research Report No #06 Uneven Spaces: Core and Periphery in the Gauteng City-Region*. Retrieved 10 August, 2022, from https://cdn.gcro.ac.za/media/documents/Uneven_Spaces_report_2017.pdf
- Pettersen, I.J., Nyland, K. & Robbins, G. (2020). "Public procurement performance and the challenge of service complexity – the case of pre-hospital healthcare", Journal of Public Procurement, Vol. 20 No. 4, pp. 403–421. <https://doi.org/10.1108/JOPP-01-2020-0002>
- Pooe, D., Mafini, C., & Makhubele, D., (2014). Investigating Municipal Procurement Challenges in South Africa: A Qualitative Study. International Business & Economics Research Journal (IBER). 14. 67. 10.19030/iber.v14i1.9033. https://www.researchgate.net/publication/297750311_Investigating_Municipal_Procurement_Challenges_in_South_Africa_A_Qualitative_Study
- Post-2015 National Energy Efficiency Strategy*, Department of Energy (2016).
- Prince, D., (2009). Bureaucracy Continued Problems with bureaucracy. Retrieved 20 October, 2021, from <http://home.insightbb.com/~davidprince/bureaucracy2.pdf>
- Procurement and The Financial Sustainability of Eskom, Final Report - Eskom Inquiry
- Qhobosheane, L.A., (2018). *The Impact Of Political Interference In State-Owned Companies: A Case Study On Sabc* (Master's Thesis). Retrieved 23 October, 2021 from <https://scholar.ufs.ac.za/bitstream/handle/11660/9256/QhobosheaneLA.pdf?sequence=1&isAllowed=y>

- Ramfol, R. & Nakhle, C. (2019). Funding the transition to renewable energy. Taxation: Changing Pathways for Africa, University of Pretoria, October 7-10.
- Ramfol, R., (2019). *Taxation of The Extractive Industry in The Context of Contemporary International Fiscal Regimes: Lessons for South Africa* (Doctoral thesis). Retrieved 23 March, 2021, from https://repository.up.ac.za/bitstream/handle/2263/74563/Ramfol_Taxation_2019.pdf?sequence=1&isAllowed=y
- Reed, D. (1999). Stakeholder Management Theory: A Critical Theory Perspective. *Business Ethics Quarterly*, pp. 9, 453. <https://doi.org/10.2307/3857512>
- Reed, D. (2018). Stakeholder Management Theory: A Critical Theory Perspective. *Business Ethics Quarterly*, 9(3), 453–483. doi:10.2307/3857512
- Reed, M.S., Vella, S., Challies, E., de Vente, J., Frewer, L., Hohenwallner-Ries, D., Huber, T., van Delden, H., (2018). A theory of participation: what makes stakeholder and public engagement in environmental management work? *The journal of the Society for Ecological restoration*. 26(1), 7-17. doi: <https://doi.org/10.1111/rec.12541>
- REN21. 2020. *Renewables 2020 Global Status Report*. (Paris: REN21 Secretariat). Retrieved from ISBN 978-3-948393-00-7 Retrieved February 20, 2021, from https://www.ren21.net/wp-content/uploads/2019/05/gsr_2020_full_report_en.pdf
- Report of The Portfolio Committee on Public Enterprise on the Inquiry into Governance (2018). Retrieved from 28 NOV.pdf' (no date). Retrieved August 18, 2021, from <https://www.parliament.gov.za/storage/app/media/Links/2018/November%202018/28-11-2018/Final%20Report%20-%20Eskom%20Inquiry%2028%20NOV.pdf>
- Reporter, A. (2019, March 25). Eskom rolling powercuts hurting small businesses *IOL* Retrieved from <https://www.iol.co.za/business-report/economy/eskom-rolling-powercuts-hurting-small-businesses-20071333>
- Reporter, S. (2019, December 17). Task force to provide SMEs with financial support during load shedding. (n.d.) *IOL*. Retrieved 10 September, 2022, from <https://www.iol.co.za/business-report/economy/task-force-to-provide-smes-with-financial-support-during-load-shedding-39320168>
- Roberts, R., & Mahlangu, A., (2018). Sustainable Energy and Climate Change In Municipal IDPS 2017–2018. Retrieved 10 September, 2022, from https://www.cityenergy.org.za/wp-content/uploads/2021/02/resource_475.pdf
- Rogerson, C. M., & Nel, E. (2016). Planning for local economic development in spaces of despair: Key trends in South Africa's 'distressed areas. *Local Economy*, 31(1–2), 124–141. <https://doi.org/10.1177/0269094215623731>
- Ryan, C. (2023, January 20). *How load shedding is crippling municipalities*. Moneyweb. Retrieved 27 March, 2022, <https://www.moneyweb.co.za/news/south-africa/how-load-shedding-is-crippling-municipalities/>
- Salter, D. (2021, March 12). Load-shedding is a major obstacle for small businesses. *Engineering News* (n.d.). Retrieved 20 March, 2022, from <https://www.engineeringnews.co.za/article/load-shedding-a-major-obstacle-for-small-businesses-2021-03-12>

- Sape, T.K. (2018). *The efficacy of the Emfuleni Local Municipality Procurement Systems*. Vanderbijlpark: NWU. (Master's thesis). Retrieved 20 October, 2021, from https://repository.nwu.ac.za/bitstream/handle/10394/33287/Sape_JT.pdf?sequence=1&isAllowed=y
- Satishprakash, S., (2020). CONCEPT OF POPULATION AND SAMPLE. Retrieved 20 August, 2022, from https://www.researchgate.net/publication/346426707_CONCEPT_OF_POPULATION_AND_SAMPLE
- Scheba, A., & Turok, I. N. (2020). Strengthening township economies in South Africa: The case for better regulation and policy innovation. In *Urban Forum* 31(1), 77-94. doi:<http://hdl.handle.net/20.500.11910/14756>
- Seleka, N., (2021. 30 Sep.) Our homes are death traps - Khutsong residents live in fear as sinkholes swallow houses News24. Retrieved 20 March , 2022, from <https://www.news24.com/news24/southafrica/news/our-homes-are-death-traps-khutsong-residents-live-in-fear-as-sinkholes-swallow-houses-20210930>
- Selomo, M.R.; Govender, K.K. Procurement and Supply Chain Management in government institutions: A case study of select departments in the Limpopo Province, South Africa. *Dutch J. Financ. Manag.* 2016, 1–10 Available online: <https://s3.amazonaws.com/academia.edu.documents/50733366/> (accessed on May 10 2020).
- Sibisi, S. (n.d.). (2009.) *Brushing against the grains of history: Making local economic development work in South Africa*. 5.DBSA: Midrand. <https://www.dbsa.org/sites/default/files/media/documents/2022-11/Brushing%20Against%20the%20Grains%20of%20History%20Making%20Local%20Economic%20Development%20Work%20in%20South%20Afr%20-%202009.pdf>
- Slight, S., Cresswell, K., Robertson, A., Hubby, G., Avery, T., & Sheikh, A. (2011). The Case Study Approach. *BMC Medical Research Methodology*, 11, 100. <https://doi.org/10.1186/1471-2288-11-100>
- South Africa. (200). *Preferential Procurement Policy Framework Act 2000: Preferential Procurement Regulation*, retrieved March 20, 2022, from http://www.thedtic.gov.za/wp-content/uploads/PPPFA_Regulation.pdf
- South African Energy Efficiency Label Appliance Sales Retail Training Learner Guide. (2018). Retrieved 26 December, 2022, from <https://savingenergy.org.za/wp-content/uploads/2018/05/Energy-Label-Learner-Guide.pdf>
- South African History Online. 23 Apr. 2020. InfoUpdate 19 of Sep 2017: South Africa's key economic policies changes (1994-2013) Retrieved 14 July, 2020, from <https://www.sahistory.org.za/article/south-africas-key-economic-policies-changes-1994-2013>
- South African Local Government Association(SALGA) Study on Public Procurement in Local Government.pdf Retrieved 20 October, 2022, from <https://www.salga.org.za/Batch%201%20-%20Latest%20Knowledge%20Products/SALGA%20Study%20on%20Public%20Procurement%20in%20Local%20Government.pdf>
- South African Renewable Energy Masterplan (SAREM) *An industrialisation plan for the renewable energy value chain to 2030 Draft Masterplan for review by Executive Oversight Committee*

- (2022). Retrieved 23 March 2022, from <https://www.green-cape.co.za/assets/SAREM-Draft-March-2022.pdf>
- Stats SA Q2(2021). Africa, S. S. (n.d.). *GDP rises in the first quarter of 2021* | Statistics South Africa. Retrieved 20 April,2021, from <http://www.statssa.gov.za/?p=14423>
- Svarc, J. (2023, January 18). *Most efficient solar panels 2023*. CLEAN ENERGY REVIEWS. <https://www.cleanenergyreviews.info/blog/most-efficient-solar-panels>
- Tamsyn, B. (2019). *The impact of 'load-shedding' within the Nelson Mandela Bay restaurant industry*. (Honours thesis). Retrieved 10 July 2021, from <https://iiespace.iie.ac.za/handle/11622/323>
- Task force to provide SMEs with financial support during load shedding. (2019, December 17). IOL, P.1. Retrieved 10 July 2021 from <https://www.iol.co.za/business-report/economy/task-force-to-provide-smes-with-financial-support-during-load-shedding-39320168>
- The Institute of Directors in South Africa (2016) King IV Report on Corporate Governance for South Africa 2016 Retrieved 23 June,2021, from <https://www.adams.africa/wp-content/uploads/2016/11/King-IV-Report.pdf>
- The South African German Energy Programme SAGEN*. (2022). Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. <https://www.sagen.org.za/publications/all-publications/181-sagen-brochure-web/file>
- Montmasson-Clair, G., Kritzing, K., Scholtz, L., & Gulati,M., (2017). *New roles for South African municipalities in renewable energy - A review of business models*. Retrieved from <https://www.tips.org.za/research-archive/sustainable-growth/green-economy-3/item/3325-new-roles-for-south-african-municipalities-in-renewable-energy-a-review-of-business-models>
- Tian, A., Zünd, D., & Bettencourt, L. M. A. (2021). Estimating Rooftop Solar Potential in Urban Environments: A Generalised Approach and Assessment of the Galápagos Islands. *Frontiers in Sustainable Cities*, 3. <https://doi.org/10.3389/frsc.2021.632109>
- Tichapondwa, S. M. (2013) *Preparing your Dissertation at a Distance: A Research Guide*. Retrieved 25 March, 2021, from https://www.sadc.int/files/3713/7821/2867/Dissertation_PDF.pdf
- Transition for South Africa, *Daily Maverick*, Retrieved 23 June,2021 from <https://www.dailymaverick.co.za/article/2019-07-04-a-different-eskom-achieving-a-just-energy-transition-for-south-africa/>
- Tucker, C., & Kamukwamba, L., (2020). Public Procurement & Government Contracts. Chambers Global Practice Retrieved 25 October,2022, from Guide.<https://www.bowmanslaw.com/wp-content/uploads/2020/05/Public-Procurement-and-Government-Contracts.pdf>
- Turok, I., & Visagie, J. (2022, February 17). *South Africa should design economic policy based on strengths of regions: Here's how*. The Conversation. 30 March , 2022,from <http://theconversation.com/south-africa-should-design-economic-policy-based-on-strengths-of-regions-heres-how-176104>
- United Nations (2021) Theme Report on Energy Transition Towards the Achievement of SDG 7 and Net-Zero Emissions. Retrieved 30 June,2022, from https://www.un.org/sites/un2.un.org/files/2021-twg_2-062321.pdf

- Van Der Walddt, G., Khalo, T., Nealer, E., Phutigae, K., Van Der Walt, C., Van Niekerk, D., & Venter, A., (2014). *Municipal Management Serving People*. Claremont, Juta and Company
- van der Walt, M.-L., van den Berg, J., & Cameron, M. (2017). *State of Renewable In South Africa*. Department of Energy. Retrieved From <https://www.energy.gov.za/files/media/Pub/2017-State-of-Renewable-Energy-in-South-Africa.pdf>
- Van Niekerk, R (2017) The African National Congress: Social Democratic Thinking and the Good Society, 1940–1962 in Webster, E & Pampallis, K (edit) *The Unresolved National Question in South Africa: Left Thought Under Apartheid*. Johannesburg: Wits University Press [ESSENTIAL] Retrieved 26 June , 2021, from <https://wits-e.wits.ac.za/access/content/group/ca0f37a1-09e5-4c29-b18a-7fc16ca85d48/CLASS%20%20Motala%20%20Vally%20%20The%20Unresolved%20National%20Question%20in%20South%20Africa-%20Left%20Thought%20Under%20Apartheid%202017.%20Van%20Niekerk%20pp%2042%20-%2060%20pdf.pdf> Date of access :26 May 2020.
- van Zyl, A. (2023, February 02). *Zoutnet | News | Load-shedding is costing municipalities millions in lost revenue*. <https://www.zoutnet.co.za/articles/news/57324/2023-02-02/load-shedding-is-costing-municipalities-millions-in-lost-revenue>
- Verbeke, A., Tung, V. The Future of Stakeholder Management Theory: A Temporal Perspective. *J Bus Ethics* 112, 529–543 (2013). <https://doi.org/10.1007/s10551-012-1276-8>
- Von Ketelhodt, A, & Wöcke, A. (2008). The impact of electricity crises on the consumption behaviour of small and medium enterprises. *Journal of Energy in Southern Africa*, 19(1), 4-12. Retrieved 20 October, 2021, from http://www.scielo.org.za/scielo.php?script=sci_arttext&pid=S1021-447X2008000100001&lng=en&tlng=en.
- Voropai, N & Hammons, T. (2006). Panel Session: Power Markets of Asian Countries in the International Markets Environment. (In Hammons, T.J. 2006. IEEE 2006 General Meeting, Montreal Canada. p1-99).
- Vyas-Doorgapersad, S., & Masibigiri, I. (n.d.). *FACTORS IMPEDING SERVICE DELIVERY IN SOUTH AFRICAN MUNICIPALITIES: THE CASE OF CITY OF JOHANNESBURG* - University of Johannesburg. Retrieved 20 February, 2023, from <https://ujcontent.uj.ac.za/esploro/outputs/journalArticle/FACTORS-IMPEDING-SERVICE-DELIVERY-IN-SOUTH/9915180407691>
- West Rand District Municipality development profile and model (2020) 48/52 Profile And Analysis District Development Model West Rand District Municipality GAU Retrieved 20 June, 2022, from https://www.cogta.gov.za/ddm/wp-content/uploads/2020/07/West_Rand_District_Profile.pdf
- White Paper on the Energy Policy of the Republic of South Africa December 1998*, (testimony of Department of Minerals and Energy).Retrieved17 August, 2022, from https://www.energy.gov.za/files/policies/whitepaper_energypolicy_1998.pdf
- White Paper on the Renewable Energy Policy of the Republic of South Africa November 2003*, DEPARTMENT OF MINERALS AND ENERGY. Retrieved 17 August, 2022, from https://www.gov.za/sites/default/files/gcis_document/201409/261691.pdf

- Winkler, H. (2005). Renewable energy policy in South Africa: Policy options for renewable electricity. *Energy Policy*, pp. 33, 27–38. Retrieved 17 August, 2022, from [https://doi.org/10.1016/S0301-4215\(03\)00195-2](https://doi.org/10.1016/S0301-4215(03)00195-2)
- Yuen, K., Luciani, G., & Zuma, J. (2014). REIPPP-A New Dawn for South African Renewables? An analysis of renewable energy prices in the South African Renewable Energy Independent Power Producer Procurement programme Retrieved 29 March, 2022, from <https://www.semanticscholar.org/paper/REIPPP-A-New-Dawn-for-South-African-Renewables-An-Yuen-Luciani/aacd4368be901420abfcb008a0d1de12d8467fb1>
- Zainal, Z. (2007). Case study as a research method. *Jurnal kemanusiaan*, (9), 1-6. Retrieved 23 August, 2022, from <https://jurnalkemanusiaan.utm.my/index.php/kemanusiaan/article/view/165/158>
- Zeng, S., Yuchen, L., Liu, c., Xin N., (2017). A review of renewable energy investment in the BRICS countries: History, models, problems and solutions, *Renewable and Sustainable Energy Reviews*, 74(1) 860-872. Doi: <https://doi.org/10.1016/j.rser.2017.03.016>.

Appendices



Appendix 1: Township-based Small Micro-Medium Enterprises (SMMEs).

Date & Time:	Name of Business:
--------------	-------------------

1. Where is your business located? (Khutsong North, South).
2. How long has your SMME been operating? (Less than 12 months or more than 24 months).
3. Have you registered your SMME with the Companies and Intellectual Property Commission (CIPC)? (Yes/No).
4. Does your SMME have a B-BBEE accreditation? (Yes/No) If the answer is Yes, what B-BBEE level is it?
5. Have you registered your SMME with the National SMMEs Database for Funds? (Yes/No).
6. Does the operation of business fully depend on electricity? (Yes/No).
7. What is the nature of your SMME building? (High or Low rise).
8. Does your SMME building have enough room to accommodate a solar panel ranging from the following options?
 - 1.6 m tall and 1m wide or,
 - 2 m tall and 1m wide.
9. What is your rooftop made from? Please select one option below.

Option 1: Wood Shingles

Option 2: Metal Roofing or Corrugated Iron

Option 3: Clay Tiles

Option 4: Slate

10. What type of rooftop does your SMME have? Please select one option below.
(Please note that a depiction of the roof types will be provided).

Option 1: Gable Roof

Option 2: Hip Roof

Option 3: Dutch Roof

Option 4: Flat Roof

Option 5: Shed Roof

11. Does your roof show any signs of old age (Cupping or lifting)? (Yes/No).
12. What direction is your roof facing? (North, East, South or West).
13. Does your roof get exposed to the sun from 9 am to 4 pm or at least get 6 hours of direct sunlight? (Yes/No).
14. Is your rooftop surrounding exposed to any obstructions?
Please select any applicable.
- None.
 - Trees,
 - Chimneys,
 - shadowed area,
 - Neighbourhood buildings
 - List any other obstruction not mentioned above.

15. What business sector is your SMME classified? Please tick an option applicable to your business.

- Building and hardware
- Hair and beauty salons,
- Fast food outlets and catering
- Spaza and tuck shops,
- Panel beaters,
- Childcare services,
- Backroom rentals,
- Shebeen or tavern.

16.

As a business owner, how has loadshedding affected your business operation?

17. How often does load shedding occur on a weekly basis and for approximately how many hours?

18. What are some of the challenges and risks that rolling power cuts have on your business? How does this affect your storage and clientele?

19. What risk measures have your business adapted to minimize the outcome of power outages in your business?

20. Have you received any incentives from the government or insurance to compensate for damages incurred if any?

21. How do you make up for the loss of profits?

22. As a business have you sought alternative renewable energy funding from the government to assist with addressing load-shedding? (Yes/No)

Kindly elaborate more on your answer.

23. Do you have knowledge about the Green Fund offered by the Department of Forestry, Fisheries, and the environment? (Yes/No)

24. Do you have any knowledge or heard about the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or Independent Power Producers (IPP)? (Yes/No.) If the answer is yes, what is your understanding of the REIPPPP or IPPs?

25. Do you have any knowledge about the REIPPPP implementation strategy? (Yes/No)

26. Do you have any knowledge of how the implementation business model of the REIPPPP nominated municipalities as Independent Power Producers? (Yes/No).

If answered Yes, in what way do you think the REIPPPP can encourage Khutsong township's economic development?

27. As a Township-based SMME would you be willing to be subcontracted as IPP, making use of your rooftop to sell solar electricity back to the grid? (Yes/No)
28. What factors do you think can prevent you from participating as a sub-contracted IPP selling solar energy as a Township-based SMME?
29. What skills do you think you require as a Township-based SMME owner to sell solar electricity back to the grid?
30. Would you enrol with a local TVET college for a Renewable Energy and skills development course? (Yes/No)?

Appendix 2: Types of Roofing Infrastructure.

This section serves as a section illustrating the varying types of roofs to help the SMME owner being interviewed to determine which roof matches their businesses to answer the following question:

10. What type of rooftop does your SMME have? Please select one option below.
(Please note that a depiction of the roof types will be provided).

Types of roofs

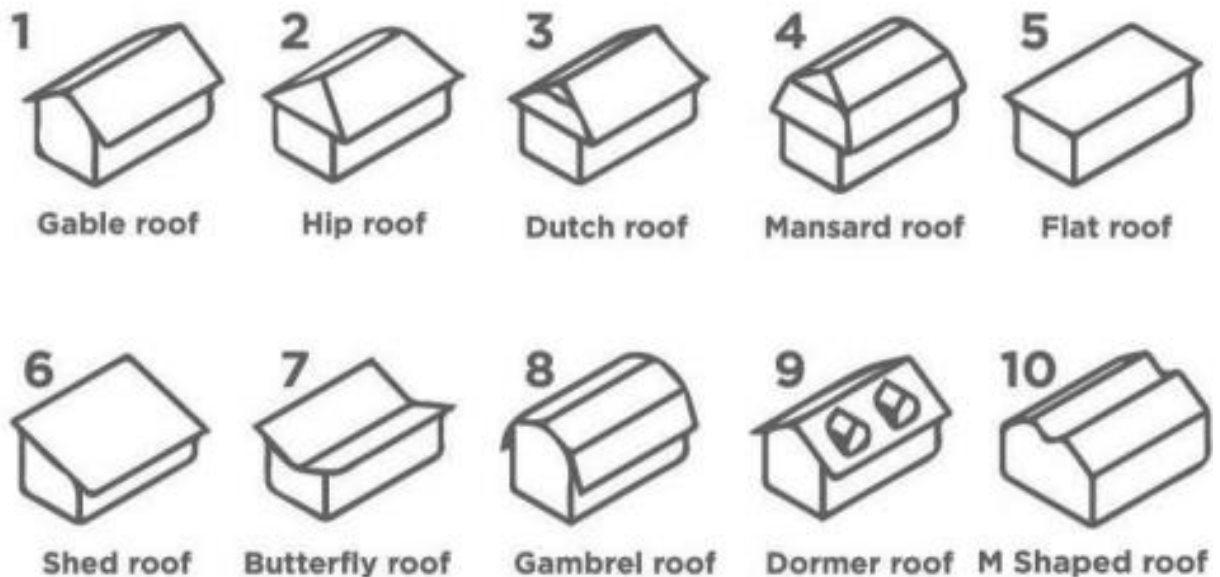


Figure 1 Source: cupapizarras.com

Appendix 3: Merafong Local Municipality Officials: 1) Local Economic Development, 2) Water & Lights 3) Finance, and 4) SMME Business Development.

1. Why was the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) formulated? And what role do you think municipalities will play to anchor its implementation?
2. What business and financial model does the municipality have in place to sell electricity directly to consumers? And given that the government proposed to make use of the municipal business model to help implement the REIPPPP initiative: Do you think the current business and fiscal model used by the Merafong Local Municipality would enable the municipality to perform functions as an IPP? (Yes/No)

2.1. If the answer is Yes, kindly elaborate.

2.2 If the answer is No, what key mechanisms would be required to enable the municipality to perform functions as an IPP?

2.3 Since Eskom experienced macro-public procurement challenges, what municipal legislative frameworks and key policy prescripts do you think the Merafong Local Municipality can adopt to prevent similar challenges at a micro-municipal public procurement level?

2.4 What potential risks do you think can emerge from the Merafong Local Municipality operationalizing the REIPPPP as IPPs? And What proactive strategic interventions do you think can help mitigate the risks from emerging?

2.5 How has Loadshedding affected the distribution of power supply to local consumers within the Merafong city region, specifically township-based SMMEs? And what strategies does the municipality have in place to help Khutsong township-based SMMEs mitigate the effects of loadshedding affecting their business operation?

2.6 How do you think Khutsong township-based SMMEs can be factored into the new municipal fiscal and operational model? And What skills do you think this initiative will bring to support Khutsong township's economic development?



Appendix 4: Merafong Local Municipality Official :1) Skills Development.

1. How can the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) plan encourage economic and skills development within the Khutsong township and its economy?
2. What skills and job opportunities do you think the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), a South African renewable energy initiative will bring to support Khutsong township's economic development? And which Khutsong township SMME sector do you think could benefit from the proposed REIPPPP initiative?
3. What strategies or measures would you recommend that the Merafong City Local Municipality Local Economic Development Strategy should adopt for the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) skills development initiative?
4. What municipal legislative frameworks and key policy prescripts do you think the Merafong Local Municipality can adopt to ensure the successful implementation of the skills development and job opportunities through the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP)?



Appendix 5: Participation Consent Sheet.

***Research Title: Exploring South Africa's Renewable Energy Programme and its Potential
Role in Khutsong Township Economic Development.***

1. I have been given a Participant Information Sheet which explains the nature and processes involved in this study, which is attached hereto;
2. I was given time to read it, or had it read to me, in the language I best understand;
3. I was given time to ask any questions I wanted to and found any answers given to me to be reasonable and satisfactory;
4. I believe I fully understand why the study is being conducted and what the intended outcomes will be;

(Please circle the relevant option below)

5. I agree that my participation will remain anonymous (Yes/No)
6. I agree that the researcher may use anonymous or pseudonymous quotes in her research (Yes/No)
7. I agree that the information obtained may be used in an anonymized format post the primary data collection, for academic purposes by other researchers, subject to obtaining their own ethics clearance. (Yes/ No)
8. I understand that there will be no immediate benefit to me, should I agree to participate, nor will I receive any payment; conversely, participation will not cost me anything but my time;
9. I understand that, even if I initially consent to participate in the study, I may withdraw at any time and would not be required to give any reasons. If that happened, any data collected about me for the study would immediately be destroyed unless I consent for it to be retained.
10. I have been given a range of contact details listed below. If I require further information or become concerned about any aspect of this study, I am free to speak to any of these contacts.

Contact details:

Principal Investigator, Phemelo Mashamaite, Cell phone no.082 925 5432, email at, 2386524@students.wits.ac.za

Supervisor, Dr Kagiso Pooe Tel: 011 717 9999 email: tk.pooe@wits.ac.za

Name of Participant: _____
Date: _____
Place: _____
Signature or mark: _____

Witnessed by:

Name of Witness: _____
Signature: _____
Date: _____



Appendix 6: Consent Form for Audio Recording of Study Participation.

Research Title: Exploring South Africa's Renewable Energy Programme and its Potential Role in Khutsong Township Economic Development.

I hereby consent to an audio recording of the Semi-Structured Interview discussion¹.

I understand that:

- The recording will be stored in a secure location (a password-protected computer) with restricted access to the researcher and the research supervisor.
- The recording will be transcribed, and any information that could identify me will be removed,
- The recordings will be erased within either (a) two (2) years of the publication of the research findings or (b) six (6) years if no publications arise from this research.
- I agree that the information obtained may be used in an anonymized format post the primary data collection, for academic purposes by other researchers, subject to obtaining their own ethics clearance. (Yes/ No)

(Please circle the relevant option below)

- I agree that the information obtained may be used in an anonymized format post the primary data collection, for academic purposes by other researchers, subject to obtaining their own ethics clearance. (Yes/ No)
- Anyone wishing to access this information in the future will first have to obtain the approval of the Human Research Ethics Committee (Non-Medical) of the University of the Witwatersrand, Johannesburg.
- Without any information that could identify me, direct quotes from my interview may be cited in the research report or other write-ups of research.
- I agree that the interview may be recorded (Yes/No)

Name of Participant: _____

Date: _____

Place: _____

Signature or mark: _____

Witnessed by: _____

Name of Witness: _____

Signature: _____

Date: _____



Appendix 7: Merafong City Local Municipality Permission Letter.



MERA FONG CITY LOCAL MUNICIPALITY

P O BOX 3, CARLETONVILLE, 2500 - TEL (018) 788 9622 FAX: (018) 788 9616
Email: wlechuti@merafong.gov.za

OFFICE OF THE EXECUTIVE DIRECTOR: ECONOMIC
DEVELOPMENT AND PLANNING

MEMORANDUM

TO : Acting Municipal Manager

FROM : Acting Executive Director: Economic Development and Planning

DATE : 27 March 2023

SUBJECT : Request for Permission to Conduct Interviews: Wits University

The attached self-explanatory letter emailed to my office on Thursday, 23 March 2023. The Student of Wits University hereby request permission to conduct a research in "Exploring The Renewable Energy Independent Power Producer Programme And Its Possible Role In Creating An Enabling Environment For Khutsong Township-Based Small Micro-Medium Enterprises To Sell Solar Electricity Back To The Grid". Your view in this regard would be appreciated.

Yours faithfully

JH SMITH
ACTING EXECUTIVE DIRECTORY
ECONOMIC DEVELOPMENT & PLANNING

APPROVED / NOT APPROVED

L MERE
ACTING MUNICIPAL MANAGER

Appendix 8: Ethics Clearance Certificate.

SCHOOL OF GOVERNANCE ETHICS COMMITTEE

CONSTITUTED UNDER THE UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)

CLEARANCE CERTIFICATE

PROTOCOL NUMBER: WSG-2022-36

PROJECT TITLE

**Exploring South Africa's Renewable Energy Programme and its
Potential Role in Khutsong Township Economic Development**

INVESTIGATOR

Phemelo Michelle Mashamaite

SCHOOL/DEPARTMENT OF INVESTIGATOR

School of Governance

DATE CONSIDERED

29 July 2022

DECISION OF THE COMMITTEE

Approved unconditionally

RISK LEVEL

MINIMAL RISK

EXPIRY DATE

Date of submission of the project Research Report

ISSUE DATE OF CERTIFICATE

29 Month 2022

CHAIRPERSON

Rekgotsafetse Chikane
Rekgotsafetse Chikane

cc: Supervisor: **Dr Kagiso Poee**

DECLARATION OF INVESTIGATOR

To be completed in duplicate and **ONE COPY** returned to the Chairperson of the School/Department 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/we undertake to resubmit the protocol to the Committee.



Signature

Date

30 /07 / 2022

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES



Appendix 9: Ethics and Title Approval Letter.

Research Office:

Lehlohonolo

Tel: 011 717 3113

Email: lehlohonolo.mm.olotsane@wits.ac.za

Research Ethics Chair:

Rekgotsofetse Chikane

Tel: 011 717 3869

Email: rekgotsofetse.chikane@wits.ac.za

29 July 2022

Dear Phemelo Michelle Mashamaite

Title: Exploring South Africa's Renewable Energy Programme and its Potential Role in Khutsong Township Economic Development.

Student Number: 2386524

Degree: Masters of Management

Ethics Clearance Number: WSG-2022-36

All candidates must satisfy the University's ethical standards for research. Your ethics application has been received and reviewed by the Wits School of Governance Human Research Ethics Committee.

Your ethical clearance has been approved subject to you getting permission to conduct research from all sites where research is conducted. The letter(s) of permission to undertake research must be submitted to the WSG Research Office and kept on file with your final proposal and other ethics documents.

You may commence your data collection under the guidance of your supervisor. In the event that the scope, methodology or nature of the research changes, you are required to submit another ethics application reflecting the changes.

The onus is on you as the candidate, with support from your supervisor, to ensure your research complies with university human research ethics policies and protocols at all stages of the research process.

It is recommended that you keep this letter in a safe place as you are responsible for ensuring you have proof of ethics clearance and have lodged the ethics clearance / protocol number with Faculty before final submission of your research report. If you do not have an ethics clearance number, you are not permitted to graduate.

Please do not hesitate to contact me if you have any queries.

Yours sincerely,

Rekgotsofetse Chikane
Research Ethics Chair

www.wits.ac.za/wsg

2 St David's Place, Johannesburg, 2050, Parktown, South Africa

E: admissions.wsg@wits.ac.za or shortcourses.wsg@wits.ac.za | T: +27 717 3520