The Societal Perspective of Postgraduate students at the Wits Business School towards the Just Energy Transition in South Africa

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ABSTRACT

The purpose of this research is to explore postgraduate students; understanding of the Just Energy Transition (JET) in South Africa in order to uncover key areas of consideration from society's point of view and their suggestions for implementation. The qualitative study followed an interpretive approach, interviewing twenty-one (21) postgraduate students at Wits Business School. The data was analysed through coding, from which themes were derived.

The qualitative study identified concerns about the social impact of the transition, especially on vulnerable groups like the poor and workers in the coal industry. The findings highlight the need for strategies that address the impact on these groups, while also considering crucial factors like poor governance, unemployment, and electricity affordability. A phased approach with an initial focus on cleaner coal technologies and strong stakeholder engagement is recommended.

The study also suggests recommendations for both the government and individuals. The government should rebuild trust, invest in cleaner energy sources while utilizing existing resources responsibly, and promote job creation through localization. Individuals are encouraged to educate themselves about the JET and its benefits. Ultimately, the research emphasizes the importance of socially just and inclusive approaches to ensure a successful and sustainable energy transition in South Africa.

KEYWORDS– Just energy transition, public acceptance, low-carbon energy, renewable energy

DECLARATION

I, Maria-Salome Gaudence Milanzi, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in Energy Leadership at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Name: Maria-Salome Gaudence Milanzi Signature: 

Signed at Melrose

On the 27th day of February 2024

DEDICATION

I dedicate this research to my loving parents, Maj. General (rtd) Gaudence Milanzi and Colonel (rtd) Ansila Chilumba. All that I am is because of you and I am eternally grateful.

ACKNOWLEDGEMENTS

I would like to thank my supervisor, Dr. Tsele Moloi, for his guidance during my research.

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Additionally, my brothers who would talk me into staying the course and seeing it through when I felt like giving up.

I thank my friends, who in many ways have encouraged and supported me and never let me give up, and to Lesedi who spent weekends in the office and coffee shops with me for moral support.

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Most of all, I thank God for his blessings during this time. He has been faithful throughout and has answered my prayers time and time again.

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LIST OF ACRONYMS and ABBREVIATIONS

GHG	Greenhouse Gas
HDI	Human Development Index
JET	Just Energy Transition
PCC	Presidential Climate Commission
PESTLE	Political, Economic, Social, Technological, Legal, Environmental
R	Rand
SDG	Sustainable Development Goals

CHAPTER 1. INTRODUCTION

1.1 Purpose of the study

The purpose of this study is to explore the Perspectives of Postgraduate Students towards the Just Energy Transition in South Africa. Human beings automatically resist change since change indicates an unknown phenomenon (Andreatta, 2017). In this case, the 'unknown phenomenon' is the Just Energy Transition. Depending on who is asked, the definition of the Just Energy Transition varies. The Presidential Climate Commission describe it as "ensuring that the lives and communities that are tied to high-emitting energy industries (e.g. Coal) are not left behind in the shift towards a low emissions economy" (Makgetla, 2021).

This chapter further explains the basis of this study and discusses the research problem and significance of the study. The research objectives and questions are also outlined in this chapter.

1.2 Context of the study

Societies across the world have used fossil fuels for their day-to-day energy needs such as cooking, transport, electricity, and others. These fuels have cumulatively caused adverse effects on the environment – the biggest being climate change. Heffron and Heffron (2021) recorded 7 climate records broken in 2016 caused by melting ice, very high temperatures, and destruction of reefs. This is attributed to the consecutively high use of fossil fuels for energy production such as coal and oil across the world. South Africa itself has had its share of natural disasters such as floods (Carrington, 2022) and droughts (Riaan Marais, 2022).

South Africa's energy mix comprises of coal, oil, gas, nuclear and renewable energy with coal contributing the highest at 65% (DMRE, 2021). The country possesses over 70% of the total coal resources in Africa, making coal the backbone of the South African industry. The coal mining industry alone employs nearly 93000 people as of 2021 and it generated approximately R130.57 billion

of revenue, 21.4% of the entire mining revenue. It is also the fuel source from which South Africa's electricity generation is largely derived (DMRE, 2022). This reliance on coal has contributed to record levels of load-shedding, which is disrupting the day-to-day activities of many individuals.

Despite having many positive contributions to the economy, coal usage has also made South Africa the highest polluting country in the African continent with carbon emissions as high as 452 million metric tons of carbon dioxide (Saleh, 2022). In order to deal with similar issues, there have been global initiatives towards a Just Energy Transition. The concept was introduced in North America around the 1990s to facilitate an energy transition that would be inclusive and fair to all parties involved.

Since then, documents such as the Paris Agreement have been drafted and agreements signed where countries have pledged to make changes within their energy structures by incorporating more renewable energy sources that will reduce the earth's carbon footprint. Among these is the Paris Agreement created in 2015. Around 193 countries have committed to meet the demands of this agreement which include limiting global temperature increase to below 2 degrees Celsius (Burton et al., 2019). But what does this mean for South Africa?

As a country that is heavily reliant on fossil fuels, particularly coal, South Africa would have to make drastic changes to the energy mix by replacing a large amount of its coal capacity with renewable sources such as hydro, solar, wind and biomass, among others.

A JET is advised to solve the issues of climate change, energy poverty and energy insecurity globally. The JET provides alternative energy options that are more affordable and less harmful to the environment (Halsey & Overy, 2019).

1.3 Research problem

Drastic shifts in industries often require society's acceptance in order for implementation to be truly successful. It is more so with issues that directly affect the day-to-day lives of individuals such as energy. Good economic, political, and

technological structures might be put in place but without consideration of the social aspect, implementation becomes challenging. An absence of adequate evidence while formulating policies could result in flawed assumptions regarding public expectations leading to resistance (Axon & Morrissey, 2020). The JET being a topic that is under-researched and not largely publicised is not known by many groups within society.

Without a clear understanding of the entire concept, its adoption may be impeded. Hence it is important to understand the social factors that drive energy users and the influence they play in users' decision to transition.

1.4 Purpose of the study

The main aim of this study is to explore the Societal Perspective of Postgraduate students towards the Just Energy Transition.

1.5 Research objectives

i. To explore Postgraduate students' understanding and perspective of the Just Energy Transition.

ii. To explore important social factors that should be considered during the transition.

iii. To identify strategies that can be implemented to ensure inclusivity of the society during the transition.

1.6 Research questions

i. How do Postgraduate students understand the Just Energy Transition and what is their perspective on it?

ii. What are the important social factors that should be considered during the transition?

iii. What strategies can be implemented to ensure inclusivity of the society during the transition?

1.7 Significance of the study

A transition implies that many employees who are currently employed in the energy sector will be left jobless as their skills will become redundant, not to mention other social implications. Despite reskilling and transition strategies that are intended to be implemented, it is not a surefire solution to solve the issue of unemployment. It is under this context that we explore the social factors that might influence the JET. According to neuroscience research, human beings are resistant to change due to brain structures that view it as a threat and cause fear and anxiety. Although humans are highly adaptable, they need to understand the implications of the change in order to adjust to it (Andreatta, 2017).

This research aims to identify the obstacles that might impede the transition with emphasis on social factors. In addition to the aforementioned contribution, the study will further articulate how the identified factors can be solved through the implementation of various strategies that will be recommended as a result of the findings. We look particularly at Postgraduate students because they represent future leaders who play a critical role in decision-making (*Reimagining our futures together: a new social contract for education*, 2021).

Stern (2017) argues that often, research for public acceptance is neglected until the technology has been deployed and is facing public opposition. This will be beneficial to various stakeholders across all levels since they can allocate their resources better and in a timely manner as other activities and strategies are being implemented so that society is not left behind. Heffron and Heffron (2021) stress the need for the 'Just Energy Scholarship' in order to increase public understanding and public acceptance of the JET. Without doing so, its implementation could be resisted and delayed.

Different studies have been conducted, yet much literature focuses on the other aspects of the PESTLE framework, disregarding the social aspect (Devine-Wright et al., 2017). For example, Newell and Mulvaney (2013), in 'The Political Economy of the Just Transition' explore the procedural and distributional aspects of energy politics in relation to the just transition. This report will contribute to the

conversation concerning the JET by focusing on the social aspect and how it affects the success of the JET. Additionally, many pieces of literature concerning this topic are often quantitatively grounded for example Axon and Morrissey (2020) use a mixed-method approach. This report will offer a solely qualitative approach, in order to obtain rich and comprehensive data.

1.8 Delimitations of the study

The study aims to identify the obstacles that might impede the transition, and eventually uncover possible strategies that might curb these obstacles.

The delimitations of this study are:

i. Respondents were sampled from Wits Business School hence results might not apply to other Postgraduate students at other schools.
ii. The study is limited by how well the chosen sample will represent the population.
iii. The study was conducted in Johannesburg which cannot be a completely accurate representation of the entire country.

1.9 Definition of terms

Climate Change: is the systematic yet gradual change in average weather conditions (Weber, 2010).

Public Acceptance: the extent to which a particular technology is considered to be acceptable by the public (SCHRÖDER, 2012).

Just Energy Transition: a low-carbon transition that is fair, inclusive, creates decent work opportunities and leaves no one behind(HR Bohlmann, 2023).

Society: a community, nation, or broad grouping of people having common traditions, institutions, and collective activities and interests(Mandal, 2020)

1.10 Assumptions

The following assumptions were made:

i. Respondents provided honest perspectives based on their own experiences.

ii. The answers provided by the selected respondents generate the answers this research pursued.

1.11 Structure of the Report

The research report comprises the following six chapters:

1. CHAPTER 1: This chapter serves as an outline of the purpose of the study, contextualising the study, research problem, research questions and significance of the study, delimitations, and assumptions.
2. CHAPTER 2: This chapter analyses existing literature regarding the subject. It looks at South Africa's current energy scenario, and arguments for or against an energy transition. It further explains the conceptual framework governing the study.
3. CHAPTER 3: This chapter explains the methodology followed in conducting this study. It explains the approach for data collection and methods of data analysis. Areas covered in this chapter include the research approach, research design, data collection method, population and sample, research instrument, procedure for data collection, data analysis and interpretation, limitations of the study and ethical considerations.
4. CHAPTER 4: This chapter presents findings from the collected data through semi-structured interviews. The data is analysed by initial codes extracted from the transcripts. Thereafter, they are categorised into various themes which are further discussed.
5. CHAPTER 5: This chapter discusses the findings of the qualitative study within the context of the literature review conducted in Chapter 2, integrated with the findings in Chapter 4.

6. CHAPTER 6: This chapter integrates the findings into the original research questions responding to each research question and providing recommendations to stakeholders that will benefit from this study.

CHAPTER 2. LITERATURE REVIEW

2.1 Introduction

This chapter explores what the Just Energy Transition is, the social factors that affect society and the importance of the social component of the Just Energy Transition. In this way, the researcher explores three (3) research questions that framed this study:

Question 1: How do Postgraduate students understand the Just Energy Transition and what is their perspective on it?

Question 2: What are the important social factors that should be considered during the transition?

Question 3: What strategies can be implemented to ensure inclusivity of the society during the transition?

2.2 South Africa's Energy Scenario

South Africa is a middle-income developing country which faces several issues that abate economic growth such as energy challenges, aged and inadequate infrastructures, inefficient regulatory processes which delay international and local investments and inefficient government coordination to name a few (Pollet et al., 2015). For years, the Republic was considered the 'Powerhouse of Africa', but currently faces energy challenges including unplanned outages, energy shortages, blackouts, and declining infrastructure due to many years of underinvestment in power infrastructure and energy poverty (Pollet et al., 2015).

The energy demand scenario has also increased due to livelihood patterns of those living at or below the poverty line which continues to cause constraints on the grid.

Like many other African countries, South Africa is highly dependent on fossil fuels for energy. Ergo, it is idealistic to believe that South Africa can industrialise and achieve strong economic growth through renewable energy alone. While diversifying the energy mix would lessen the burden caused by fossil fuel dependence, an abrupt halt to coal, natural gas and other hydrocarbons would threaten energy security by reducing energy supply, which is already an issue (Berahab, 2022).

However, there is potential for various renewable energy sources including (Douglas);

- Solar energy: South Africa has massive potential for solar energy generation,
- Wind energy: There are reasonable wind resources present for South Africa to generate electricity via wind sources,
- Biomass: This is already being used, but there is potential for more efficient and sustainable use,
- Hydropower,
- Wave power,
- Geothermal.

2.3 Energy Justice

Energy justice refers to the concepts of equity, accessibility, affordability, and participation in the energy system and energy transition regardless of race, nationality, income or geographic location (National Conference of State Legislatures, 2022). Incorporating such community-based initiatives promotes the adoption of decentralised renewable energy management as a co-operative approach with local governance structures enabling access to and availability of

renewable energy to extend across all levels of the community, but with particular attention to vulnerable groups (Islar et al., 2017).

Sovacool et al. (2016) investigated how concepts from justice and ethics can inform energy decision-making which they uncovered an energy justice framework centred on:

i. The availability principle states that all ought to have sufficient energy resources of high quality.

ii. The affordability principle: states that all people, including the poor, should pay no more than 10% of their income for energy services.

iii. The due process and good governance principle: This states that countries should respect the rule of law and human rights in their production and use of energy. Additionally, all people should have access to high-quality data about energy and the environment and communities must have access to fair, transparent, and accountable forms of energy decision-making. iv. The Intragenerational equity principle: states that people have the right to fairly access a certain set of minimal energy services enabling them to enjoy a basic minimum of wellbeing.

v. The Intergenerational equity principle: states that future generations have a right to enjoy a good life undisturbed by the damage our energy systems inflict on the world today.

vi. The Responsibility and sustainability principle: states that all nations' duty to protect the natural environment and its sustainability as well as minimize energy-related environmental threats.

(Sovacool et al., 2016) further elaborates on the consequences of the exclusion of community members during policymaking processes. Communities must be involved in deciding about major projects that would affect them. There have been instances in Brazil, Indonesia, Ghana, and South Africa where between 15000 to 37000 people have been involuntarily displaced due to mining activities and some of these have happened without prior consent, notification and with no room to seek reparations (Downing, 2002). The question of fairness is posed in such

cases whereby one might question who has the right to disrupt the lives of those displaced by these relocations.

2.4 Importance of an Energy Transition

The energy system is the biggest contributor to the world's GHG emissions hence decarbonisation is key to limiting global warming (Bruckner et al., 2014). In 2023, GHG emissions increased by 3%, which is comforting compared to the projected 16%. However, as per the Paris Agreement, a 28% decrease is still required by 2030.

An energy transition is required to deal with the continuously noticeable effects of climate change. Igamba (2023) identifies adverse climatic conditions such as the increase of the mean annual temperatures in South Africa by twice the global average. Additionally, there have been 86 weather-related disasters which have affected more than 22 million people across the country. Cape Town became the first major city in the world to run out of water in 2018 and all provinces experienced flooding in the first half of 2021, attesting to vivid climate change issues.

Apart from climate change, there has been an increased risk of energy crisis across the globe and the volatility in global fuel prices poses a challenge in emerging economies. Integrating renewables and other green energy sources into the energy mix can reduce dependence on fossil fuels.

However, Wackernagel et al. (2017) argue that many countries that have a high Human Development Index ranking are also countries with a higher Ecological footprint. A high HDI indicates that a country's level of human development, particularly health, knowledge, and standard of living is high. Figure 1 depicts how most countries with a high HDI, which are the most developed countries also have a high ecological footprint, indicative of the argument that as countries pursue development, their sustainability decreases. This has led researchers to the notion that the pursuit of the SDGs is harmful to the environment.

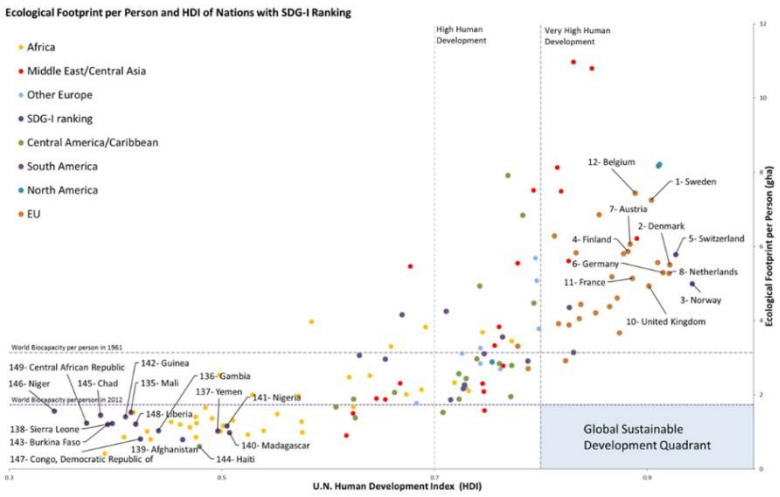

Figure 1: Ecological footprint per person and HDI of Nations with SDG- I ranking (Wackernagel et al., 2017)

2.5 The Just Energy Transition

The Presidential Climate Commission explains the Just Energy Transition as *"The just energy transition focuses on the transition of South Africa's energy sector as the country navigates the shift away from coal towards cleaner sources of energy."*

"Achieving a "Just Energy Transition" is central to the work of the Presidential Climate Commission, ensuring that the lives and communities that are tied to high-emitting energy industries (e.g., coal) are not left behind in the shift towards a low emissions economy. Indeed, the energy transition must be fair and perceived to be fair" (Commission, 2022).

International initiatives such as the Paris Agreement and the Just Transition Platform under the UNFCCC advocate for a just transition to promote and support sustainable development goals prioritising the more vulnerable communities whose livelihoods are embedded in high-emitting industries and industries that are most affected by climate change.

(Dalabajan et al., 2022) advocated for the importance of a JET, particularly for lower-income countries whose populations are more likely to experience

climaterelated injustices. These social groups include women, children, and minority groups. A JET would ensure that fairness is upheld but it would also help to reduce poverty and inequality.

The PCC identifies four sectors that should be at the forefront of the just energy transition as ‘at risk’ groups: Coal Value Chain, Auto Value chain, Agriculture and Tourism (Presidential Climate Commission, 2022b). Ensuring fairness includes identifying ways to make sure those employed in these sectors are not left behind during the transition.

While Africa is not a major contributor to greenhouse gas emissions, the effects affect the whole world. African Development Group Bank (2022) notes that despite having 17% of the current global population, Africa has only accounted for 3% of the cumulative global carbon emissions. Yet due to the nature of Africa’s economic setup, they are the most vulnerable continent. Africa heavily relies on agriculture as the backbone of their economy hence climate change greatly affects crop yield and threatens food security (Igamba, 2023).

Because of this, the whole world has a part to play in the Just Energy Transition.

There is no one-size-fits-all approach to an energy transition. What works in one part of the world may not work in other parts of the world because of geographical, economic, political, and technological differences. Hence it is crucial that different communities gauge what is most suitable for their people to create a sustainable energy future (Energy World, 2023).

Strambo et al. (2019) emphasise the importance of devising a plan that is contextspecific and realistic about the economic conditions that characterise South Africa for example if we are to phase out coal, there needs to be adequate planning for structural unemployment, resource constraints and the country’s lack of economic growth. They further warn that if the economic and environmental consequences of moving away from coal are not addressed a transition could possibly induce social destabilisation.

Other researchers believe that despite transitioning to cleaner sources of energy, ‘dirty’ sources such as coal, gas, oil and nuclear should still be used as the country strengthens its renewable capacity. Gareth Hodder (2022) advocates for gas as a bridge between coal and renewable energy since gas-fired generation emits fewer pollutants than coal. However, others believe that coal in South Africa is still crucial for the foreseeable future as a baseload for power generation (Anglo American, 2020), especially since coal is cheap and abundant in the country. Rather the focus should be on cleaner coal technologies that would revolutionise the coal industry such as high-efficiency low-emission technologies (HELE) and carbon capture, utilisation, and storage (CCUS).

2.6 Social factors influencing the JET

A crucial part of the JET is to create decent work and quality jobs while ensuring a country’s development goals are met, according to the 2015 Paris Agreement. In order to achieve this, the JET needs to facilitate the creation of jobs, industries, skills and investment for the concept to succeed. Smith (2017) recognizes social dialogue as an integral component in achieving the aforementioned factors as this allows collaboration among various groups to formulate policies that will aid in meeting the government’s development goals without leaving the community out of the decision-making process.

2.6.1 *Implications of social factors on an individual’s perspective*

For a concept to be socially accepted, it needs to positively impact social factors. Islar et al. (2017) defines energy as a socio-political relation justifying the social through its embeddedness in social organisation and most aspects of life depending on it. Energy transitions are said to be social affairs as they affect the lifestyles of those who experience them.

Cohen et al. (2014) recognized that although the opinions on energy development are mostly favourable, they encounter social resistance, which slows down development. A concept known as ‘NIMBY’ is prominent, standing for ‘not in my

backyard', whereby locals would be in support of particular energy transition measures as long as they do not directly affect their areas of living or working.

This applies especially to technologies required in facilitating the transition as renewable energy is a key component in decarbonisation and is perceived to have negative impacts such as decreasing property value, safety concerns and increased noise through the construction of wind plants.

2.6.2 *Social factors that affect society*

An individual's perception towards an energy transition may be influenced by several factors. The social factors experienced in society that influence the JET are explored below.

Oyuke et al. (2016) surveyed 36 African countries asking them what the most important problems facing the country were that should be addressed by the government. The majority of them were social problems such as unemployment, health, education, crime and security, among others as depicted in Figure 2.

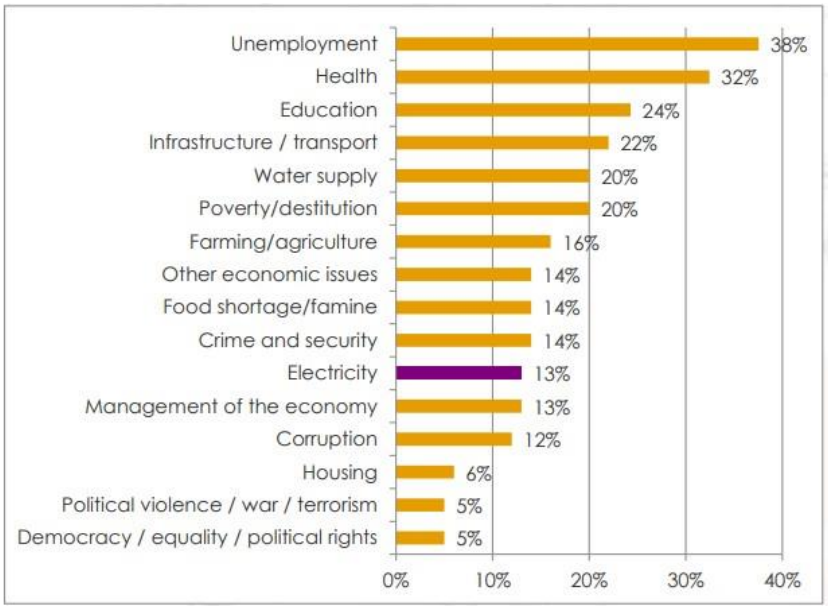

Figure 2: Most important problems across 36 countries in Africa (Oyuke et al., 2016)

a. Unemployment

The energy industry employs a large number of South Africa's population. The coal mining industry alone employed approximately 93000 people as of 2021 (Garside, 2022). A transition implies that these jobs along with those related to other non-renewable energy sources become obsolete. The unemployment rate in South Africa is one of the highest in the world and continues to grow as illustrated by Fig. 3 (O'Neill, 2022).

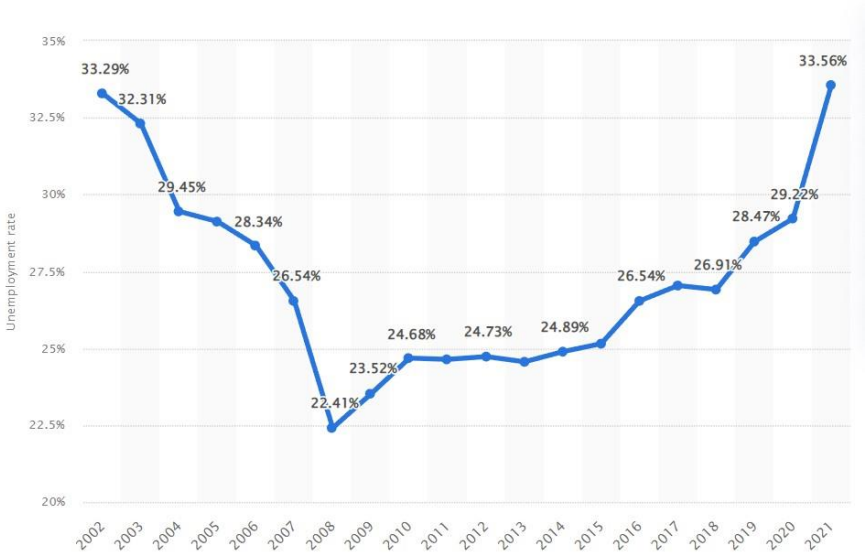

Figure 3: South Africa's unemployment rate from 2002 to 2021 (O'Neill, 2022)

Since the 2019 pandemic, there have been structural constraints in South Africa which contributed to the slowed economic recovery. The labour market was also affected with the total number of employed people decreasing consecutively for two quarters in 2021 at 14.9 million which is 1.5 million below pre-pandemic levels (National Treasury, 2021). Inadequate electricity supply limits the speed and durability of recovery as has been evident with more and more businesses closing due to loadshedding. Coupled with the rapidly growing population, literature speculates that the unemployment rate would only return to pre-pandemic levels in 2031 (PwC, 2021).

Re-skilling and upskilling of human resources are crucial to avoid increasing the employment rate. The Integrated Resource Plan of 2019 estimates that about 35000 jobs would be created with the proposed energy mix though its efficacy is

doubted. There are frameworks in place that highlight key interventions to aid in this such as; developing new skills for those who are most impacted, reskilling those whose jobs might be lost during the transition, expanding access to skills and providing reliable and affordable internet access to affected areas to assist with continuous learning and job searching (Presidential Climate Commission, 2022b).

Lambert and Silva (2012) argue that studies often portray renewable energy to be a silver bullet in boosting the economy through the generation of jobs however these assumptions are oversimplified and optimistic as they do not consider other implications such as the political, technologic, and social factors involved. (Burger, 2023) highlights that even if there is a replacement of like-for-like jobs during the transition, 33% of the adult population remains unemployed.

b. **Education**

Because it is a crucial element, anything that hinders an individual from pursuing their education will become a sensitive topic. It is believed that those with limited or no access to energy services will have fewer educational opportunities (Lelieveld et al., 2015).

In a report on electricity access and income inequality in SA, Sarkodie and Adams (2020) stated,

> *"Access to electricity is fundamental to opportunity in this age. It's the light that children study by; the energy that allows an idea to be transformed into a real business. It's the lifeline for families to meet their most basic needs. And it's the connection that's needed to plug Africa into the grid of the global economy. You've got to have power."*

The JET is a concept that is widely understood by experts in the energy field, but not the public. A knowledge gap exists concerning the implications of the transition by the public which Devine-Wright et al. (2017) argue is a hindrance to social acceptance. Instead, policies are formulated, and technologies are deployed coming as a surprise to the public, invoking resistance (Stern, 2017).

The Stakeholder Consultation framework highlights interventions for imparting knowledge about the transition such as improving the basic education system so that young learners understand climate change and its impacts, improving the higher education system so that graduates possess the competencies to secure jobs, adequately resourcing schools to improve the quality of education, reviving the adult basic education and continuous learning opportunities for adults.

c. Poverty and Inequality

Galal (2022) reports that around 18.2 million people live in extreme poverty as of 2022 in SA, with this figure expected to grow to 18.5 million by 2025. These statistics contribute to SA's state of energy poverty in which around 3.2 million households lack access to electricity, most of whom live in informal settlements.

The State of Electricity Access report highlights that without electricity, poverty eradication would be a narrow and elongated road (World Bank, 2017). With the triple threat that South Africa faces: inequality, poverty and unemployment it becomes different to access electricity, which hinders one from escaping poverty, increasing the inequality gap, and a vicious cycle is formed.

Hence, the energy transition would need to be affordable to all income groups otherwise it will only strain those at the bottom of the food chain. Durkay (2017) stated that low- and middle-income earners face barriers to installing energyefficient technologies or renewable energy improvements due to a lack of access to capital and low credit scores. However, Phua (2020) argues that renewable energy is a more affordable option for lower-income households since it would produce a lower utility bill.

d. Health

Health is dependent on several underlying factors as well as the nation's ability to provide efficient healthcare. According to County Health Rankings (2014), four (4) components influence one's health as illustrated in Figure 4. These are health

behaviours, including diet and exercise, clinical care, social and economic factors, and the physical environment. Hence, pollution and the use of carbonemitting fuels are detrimental to the health of the community as well as the environment.

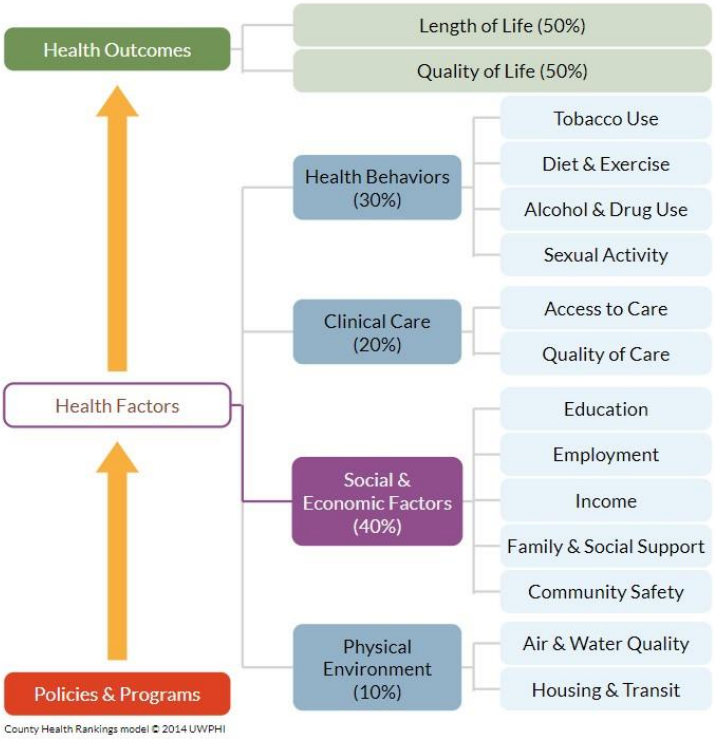

Figure 4: County Health Rankings model (County Health Rankings, 2014)

People with limited access to energy services generally have poorer health which affects energy poverty (Lelieveld et al., 2015).

2.7 The government's role in the Just Energy Transition?

The government plays a very crucial role in the implementation of the JET since it possesses many tools that would aid it such as fiscal measures, R&D, and policy formulation. Lennon et al. (2019) state that *"a sustainable energy transition requires governance structures and organisational formats that are participatory and inclusive*". This section discusses the government's role in the JET as identified in the literature.

2.7.1 *Economic roles*

i. Governments should set aside funds intended to support activities aimed at mitigating climate change and hasten a just transition. These funds should be used for investing in vocational education and training and renewable energy infrastructure and providing grants and loans to facilitate economic diversification (Smith, 2017).

2.7.2 *Social roles*

i. Facilitating social dialogues among the various stakeholders to create JET strategies that cater to all levels – community, region and country. In doing so, the needs of the public are more likely to be considered and catered for, leaving no one behind (Smith, 2017).

ii. Providing education to the public concerning the meaning and implications of the JET in order to avoid resistance. Additionally, it is the government's duty to ensure that reskilling and upskilling are executed by various companies and institutions in order to curb the threat of job losses caused by a transition.

iii. Incorporation of labour and gender rights during policy formulation in an effort to promote gender equality and empower women.

2.5.3 Political roles

i. Policy formulation focuses on addressing climate action and achieving the requirements of the Paris Agreement such as poverty alleviation. Good policies allow resources to be allocated efficiently, avoiding waste of time, money, and effort (Smith, 2017).

2.8 Conclusion of Literature Review

In summary, this chapter provided an overview of the concept of social acceptance and why it is crucial to incorporate it as the world undertakes transition activities alongside other aspects of the PESTLE framework. The social factor, being an often-neglected aspect holds numerous barriers for example the plain fact that one can never cater to all of society's wishes. However, further research could enable us to identify the majority views regarding which factors should be most considered as well as how to ensure a smooth implementation.

Several social factors could influence one's perspective of the JET; a few aforementioned are employment, education, health and income. Uncovering other factors that underlie society will be the first step towards solving the issues.

2.9 Conceptual or theoretical framework

Wüstenhagen (2007) presented an argument that social acceptance of energy technology and infrastructure can be distinguished across three dimensions namely socio-political, community and market acceptance, as presented in the figure below.

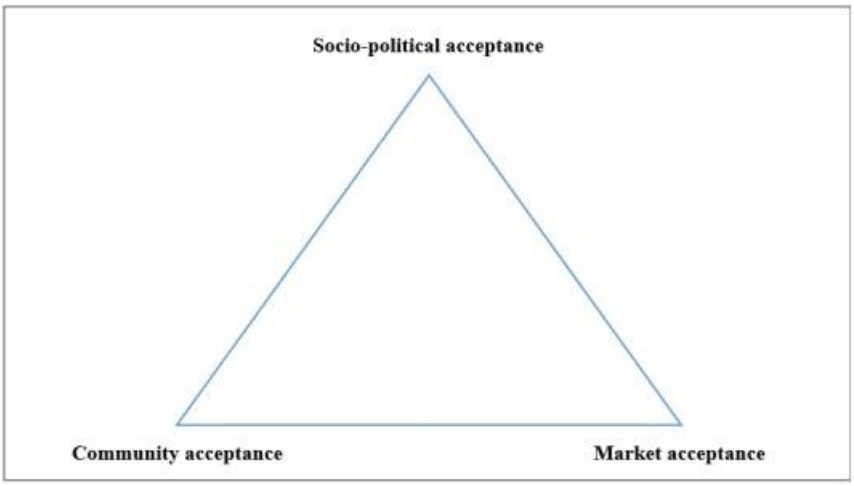

Figure 5: The triangle of social acceptance of renewable energy innovation (Wüstenhagen et al., 2007)

Socio-political acceptance is recognized as the most general level constituting the public, key stakeholders, and policymakers. Within this dimension,

acceptance is often depicted to be high through general opinion polls where the public shows support towards the idea of transitioning to greener fuel sources through implementation but does not show similar trends. Community acceptance lies within acceptance among residents and authorities where the concept of NIMBYism arises. NIMBYism refers to ‘not in my backyard’ whereby residents would be against the deployment of renewable plants because they tend to be more visible and disruptive since renewable energy conversion is carried out closer to the consumers, that is near residential areas (Wüstenhagen et al., 2007).

The last dimension – market acceptance corresponds to the adoption of a particular technology. According to Everett Rogers’ theory of innovation diffusion, change can be easily promoted in a social system through a domino effect (Rogers et al., 2014). Orr (2003) further developed a 5-step process constituting societal members’ decision to adopt an innovation which is knowledge, persuasion, decision, implementation and confirmation. Diffusion theory strongly suggests that within a society, the trend of adoption relies heavily on the innovation decisions of other members and a major barrier is uncertainty. Society can be reluctant towards the transition due to uncertainty regarding the incoming technology and the bodies that would be implementing the transition. Provided residents are able to switch to cleaner fuels without being directly disrupted in terms of their day-to-day lives, market acceptance would be better assimilated (Wüstenhagen et al., 2007).

Devine-Wright (2008) explains public acceptance across three dimensions namely, personal, social-psychological and contextual. Personal factors include socio-demographic traits such as age, gender and social class which affect an individual’s level of awareness or willingness and ability to install renewable technologies.

Psychological factors that influence public acceptance include the degree of awareness and understanding, political beliefs, perceived impacts, place attachment, perceived fairness of the development process, confidence in key

actors and, environmental beliefs and concerns. These factors motivate levels of public acceptance.

Lastly- technological factors, particularly scale and type. There are three scales of implementation of RE technology: micro, meso, and macro. Research has uncovered a general acceptance of energy transitions when it is implemented at a macro level, however, tend to experience resistance at the household (micro) level and local/ community (meso) level, when the impacts directly affect the inhabitants of the area, where the ‘NIMBY’ concept occurs.

CHAPTER 3. RESEARCH METHODOLOGY

This chapter elucidates the methodology chosen to conduct the research. Holden and Lynch (2004) describe the methodology as the "*how of research*", which requires a philosophical solution to the "*Why of the research*". It is further described as a means to systematically solve the research problem which entails a proper understanding of one's problem so that the methodology designed pertains specifically to the research and yields a valid and reliable outcome (Kothari, 2004).

This research aimed to explain the influence that social factors hold on Postgraduate students' decision to transition by answering the following questions:

i. How do Postgraduate students understand the Just Energy Transition and what is their perspective on it?
ii. What are the important social factors that should be considered during the transition?
iii. How can the inclusivity of society be ensured during the Just Energy Transition?

We will therefore discuss the research approach taken, explaining why it was deemed most appropriate and the research design to understand how the study will be conducted.

Furthermore, we will discuss the data collection methods utilised as well as the population and sample on which the study is conducted. This chapter also explains the research instrument along with the procedure for data collection, how data will be analysed, any limitations that may present themselves, the validity and reliability, ethical considerations, and a consistency table.

3.1 Research approach

The research approach and methodology employed in this study is the interpretivism paradigm. Interpretive research aims to understand the

interpretations of individuals about the social phenomena they engage with (Rehman & Alharthi, 2016). Since this methodology focuses on understanding phenomena "*through the eyes of the participants rather than the researcher*" (Cohen et al., 2017, p. 21), it is best suited for this study that deals with society's perspectives of the JET. This method employs qualitative data techniques of data collection, further explained in this chapter.

This study employed a qualitative research method. Tenny et al. (2017, p. 1) describe the method as one that "*provides deeper insight into real-world problems*" by gathering the participants' perspectives, experiences, and behaviour – something that cannot be done through merely collecting numerical data.

Patton (1985) explains qualitative research as,

> *"an effort to understand situations in their uniqueness as part of a particular context and the interactions there. This understanding is an end in itself so it is not attempting to predict what may happen in the future necessarily but to understand the nature of that setting – what it means for participants to be in that setting, what their lives are like, what's going on for them, what their meanings are, what the world looks like their particular setting…".*

With regard to the study, energy being a social issue, it was important to gauge the participants' responses by allowing them to interact without restrictions. Rather, they should be able to answer how, why, and what through open-ended questions and encouraged dialogue. This made it possible to explore various underlying phenomena that might entice a deeper argument.

Additionally, this approach enabled us to answer the research questions by identifying the factors that affect society directly from those experiencing them. It further enabled us to understand what the JET means to society in their own words and pinpoint common themes and whether the definitions portray a positive or negative outlook towards the subject. Lastly, enabled us to suggest solutions that the government can employ to make the transition smoother for all stakeholders.

3.2 Research design

In order to identify the social factors influencing the JET exploratory qualitative research was conducted. The study in question is an underexplored one with many researchers often focusing on other aspects such as the economic, technological, and political factors influencing energy transitions. Exploratory research aims to nullify, verify, and clarify according to Stouffer and Lazarsfeld (1937). When there is a lack of knowledge about a topic, or if a topic requires new hypotheses, an exploratory study is employed. This type of research is considered risky since there is no way of knowing at the beginning whether anything will come of it (Swedberg, 2020). This research also required an extensive period to explore the problem which, due to time constraints, this study did not have.

3.3 Data collection methods

Data for the research was collected via interviews in order to obtain primary data. Interviews are beneficial in collecting data on the observations, attitudes, experiences, feelings or opinions of a population (Hox & Boeije, 2005) which is in accordance with the objectives of this study. Additionally, they enable the researcher to answer the research problem by gauging the social factors that affect Postgraduate students and how this influences their perspectives of the JET. A semi-structured interview was used with the opportunity to probe for further understanding of participants' responses.

In addition to that, secondary data was analysed in order to consult similar research that has been conducted. Secondary data helps to generate new insights and strengthen the validity of primary data obtained (Nicole Ruggiano, 2019). Some forms used as part of secondary data include comments made as part of the State of Nations Address, the Integrated Resource Plan and the Stakeholder Framework by the Presidential Climate Commission.

3.4 Population and sample

3.4.1 *Population*

Satishprakash (2020) defines the population as "*the set or group of all the units on which the findings of the research are to be applied*". The population for this study was Postgraduate students at the Wits Business School. It is important to note that Wits Business School is not representative of South Africa. However, Postgraduate students represent future leaders and will be influential in the implementation of the Just Energy Transition. Extant literature supports the use of Postgraduate students as a unit of analysis since they are not only equipped with the skills and experiences to make decisions and solve complex challenges including leading the world into a more sustainable and equitable future ("The Future of Jobs Report," 2020) but are also more prone to be entrepreneurs who have major influence in society.

'Postgraduate Students' in its entirety provides too vast a population and interviewing too large a population risks the possibility of data saturation (Marshall et al., 2013). Creswell and Poth (2016) recommend a range of 20 to 30 interviewees to collect substantial data, although the number varies among methodologists. In this study, we looked at 21 interviewees across the population.

3.4.2 *Sample and sampling method*

A sample is a subset that acts as a representative of the entire population (Acharya et al., 2013). The study was done on a sample because it is impossible to investigate the problem in the whole population due to time, money, manpower and other constraints. In order to draw valid conclusions, it is crucial to correctly choose a sample that accurately represents the population, hence the sampling method is important (McCombes, 2019).

In qualitative studies, non-probability sampling methods are used which enables the researcher to identify participants who can best provide information that would aid in answering the research question (Gill, 2020). Purposive sampling was

utilised with the inclusion criterion being Postgraduate Students at Wits Business School.

Table 3: Profile of respondents

Description of respondent type	Number to be sampled
Postgraduate Students at Wits Business School	21
TOTAL number of respondents	21

3.5 Research instrument

The research instrument used in this study was semi-structured interviews. Such interviews are designed in a way that key questions are posed to the respondents, but it allows them to elaborate the response in more detail and probing questions will further be used in order to understand what the respondent is trying to say.

Interviews are essential in exploring the beliefs, views and opinions of individuals which is effective for the objectives of this study. Gill et al. (2008) explain that through interviews, the researcher can discover information that they had not previously thought of.

3.6 Procedure for data collection

Respondents were approached directly. The interview would not merely utilise the term ‘Just Energy Transition’ since this is a technical term unknown to many who are not in the associated field. Rather, the term was explained to the respondents using South Africa’s Presidential Climate Commission’s (PCC) definition. The PCC is an independent, multi-stakeholder body established by President Cyril Ramaphosa, whose purpose is to oversee the transition and facilitate it in a just and equitable manner. The PCC explains the JET as;

“The just energy transition focuses on the transition of South Africa’s energy sector as the country navigates the shift away from coal towards cleaner sources of energy.”

“Achieving a “Just Energy Transition” is central to the work of the Presidential Climate Commission, ensuring that the lives and communities that are tied to high-emitting energy industries (e.g., coal) are not left behind in the shift towards a low emissions economy. Indeed, the energy transition must be fair and perceived to be fair” (Commission, 2022).

By using this common explanation, and breaking down the PCCs framework for better understanding, the participants will be able to get a uniform idea of the JET, increasing the chances of acquiring data that is dependable.

Secondary data was assessed from consultation sessions undertaken by the Presidential Climate Commission, the Department of Forestry and Fisheries, and the South African Local Government Association.

3.7 Data analysis and interpretation

Qualitative data is difficult to analyse since analysis is generally done manually. Without the use of proper qualitative data analysis tools, all the data gathered could be useless. Dawson (2002) identifies several tools such as thematic analysis, comparative analysis, content analysis, discourse analysis and conversational analysis. This study used thematic analysis which is one of the more popular methods of analysing qualitative data.

Thematic analysis provides flexibility through the systematic identification and organisation of patterns of meaning or themes across a data set (Clarke et al., 2015). An inductive approach was employed whereby codes were procured from the content gathered. This approach enabled the researcher to avoid any bias by solely focusing on the themes that arise rather than going into the interview with pre-conceived themes.

Codes and themes were derived from the interview, using Terry et al. (2017)'s six-phase approach as illustrated below.

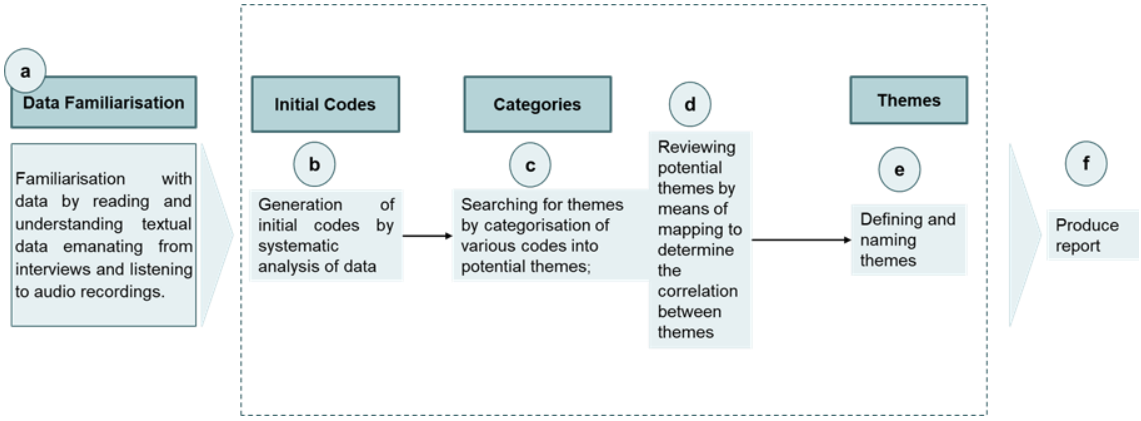

Figure 6: Framework for data analysis

3.8 Limitations of the study

Price and Murnan (2004, p. 66) define the limitations of the study as "*the systematic bias that the researcher did not or could not control and which could inappropriately affect the results*." Some of the limitations expected to be encountered in this study include those pertaining to the sample size. A sample size of 21 is typically low especially when avoiding the risk of generalizing. However, because of the intensity and extensivity of qualitative studies and the time constraints that present themselves, this number would be adequate to gather insights into the research topic and derive valid conclusions. Furthermore, the researcher has tried to curb this by choosing a diverse sample size containing participants who hold different experiences.

Another limitation is researcher bias. This can occur intentionally or unintentionally, but it affects the outcome immensely (Simundic, 2013). Bias is especially common in qualitative studies where results ultimately depend on the researcher's interpretation of the data gathered. This study attempted to avoid researcher bias by using an inductive approach when analysing data which derives themes and codes from content rather than entering into the interview with preconceived themes (Clarke et al., 2015).

3.9 Trustworthiness of the study

A research's trustworthiness is measured against four criteria namely transferability, credibility, dependability, and confirmability (Lincoln & Guba, 1986). These aspects must be considered throughout the study in order to increase its rigour.

3.9.1 *Transferability*

"*Transferability is achieved when readers feel as though the story of the research overlaps with their situation*" (Tracy, 2010, p. 845). This can be achieved by allowing direct testimonies from participants, rich descriptions and writing in a way that resonates with the reader. In this study, transferability was achieved through rich and engaging discussions with the participants that will enable the researcher to attain as much information as possible. By doing this, readers can understand better and apply it to their experiences.

3.9.2 *Credibility*

Tracy (2010, p. 842) defines credibility as *dependable, and trustworthy and "expresses a reality that is plausible or seems true*". This study ensured credibility through crystallization – specifically by incorporating multivocality. Participants were of different backgrounds with different views and opinions which eliminates bias and enhances the plausibility of the research. Another method was to prolong engagement with the participants as much as possible in order to draw out as many saliences as possible (Lincoln & Guba, 1986).

3.9.3 *Dependability*

The dependability of the research means that the same results would be obtained if the study were to be repeated (Morse, 2015). Dependability was ensured by making sure the participants had a clear understanding of the subject matter by using a uniform explanation of the JET as provided by the Presidential Climate

Commission. Additionally, the questions asked were reflective of those required to answer the research questions.

3.9.4 *Confirmability*

Confirmability of research is crucial as it ensures that the outcomes are a result of the experiences of the participants and not the researcher's bias. This was achieved by incorporating an audit trail by checking and rechecking throughout the study and creating clear and concise documentation of all the findings.

3.10 Ethical considerations

> *"Ethics is the science that deals with conduct, in so far as this is considered as right or wrong, good or bad," (Dewey & Tufts, 2019, p. 1).*

It is crucial in research to observe ethical practices as this increases the credibility of the researcher. In accordance with this, several measures were taken to ensure that the research is conducted ethically. First, the University of the Witwatersrand's Research Ethics Committee provided clearance to approve the study. Additionally, all participants had the choice to participate or not as participation was voluntary. At any point, participants were allowed to withdraw.

The respondents were also guaranteed anonymity – their data was handled confidentially and only for the purpose of this research. Participants had to give written consent in order for the interview to take place.

CHAPTER 4. PRESENTATION OF FINDINGS

This study aimed to explore the perspective of postgraduate students at Wits Business School towards the Just Energy Transition. The interview consisted of 9 questions (Annexure C) designed to address the following questions:

i. How do Postgraduate students understand the Just Energy Transition?
ii. What are the important social factors that should be considered during the transition?
iii. What strategies can be implemented to ensure inclusivity?

Interview questions 1 to 4 aimed to answer research question 1; 5 to 7 aimed to answer research question 2 and 8 to 9 aimed to answer research question 3.

4.1 Research question 1: How do Postgraduate students understand the JET

This section discusses the findings and themes resulting from the first research question (How do Postgraduate students understand the Just Energy Transition?) Results depict that South Africa currently possesses an unsustainable energy landscape. As such, diversification is required through a Just Energy Transition to ensure energy security, however, the transition should be fair, particularly prioritising the poor and those directly affected by coal.

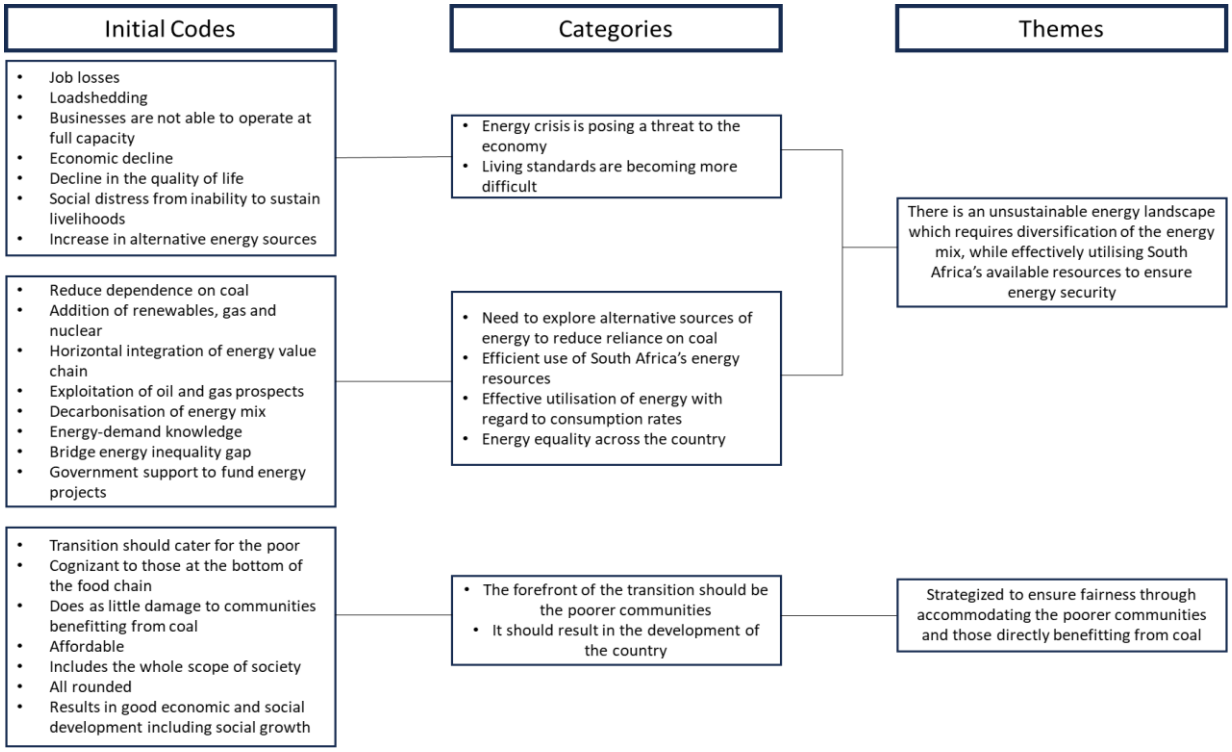

Figure 7: Findings on Research Question 1 from semi-structured interviews

Two themes that emerged from Research Question 1 are a). The JET should be strategized to ensure fairness through accommodating the poorer communities and those directly benefitting from coal b) There is an unsustainable energy landscape which requires diversification of the energy mix, while effectively utilising South Africa's available resources to ensure energy security. These are discussed below.

a) The JET should be strategized to ensure fairness by accommodating the poorer communities and those directly benefitting from coal

When asked about their understanding of the Just Energy Transition, respondents used phrases such as '*transition that looks at all aspects*', *'caters for the needs of society'*, *'cater for the poor'*, *'takes cognizance to those at the bottom of the food chain'*, etc.

A large number of societies rely on the coal industry for sustenance and a transition would mean their jobs would become redundant. In order for it to be

fair, it must take into consideration what would happen to those who possess those jobs.

One Participant stated:

> *[It is a] Transition that looks at all aspects that would make the transition possible, including transferring skillsets from carbon-intensive, how to deal with ghost towns that would be formed, labour, etc.*

While another stated:

> *It is fair if it is inclusive from top to bottom, but mostly those at the bottom, because they will be mostly affected by the changes.*

In addition to catering to the poor, respondents' understanding of the JET incorporated the provision of compensation to African countries that have not been the major contributors to climate change. This compensation would assist African countries to develop their countries seeing as the developed countries industrialised and developed their countries using fossil fuels.

Quotations illustrating this include:

> *It is a transition that acknowledges that the countries that have not been major contributors to climate change should get compensation/ incentives/ allowing African countries to exploit some of their oil/ gas prospects so they can develop their countries such that they can easily transition but also in terms of funding of these projects since the big institutions fund what they want to fund. Since the world is moving towards renewables companies might not want to fund the oil and gas projects.*

While another respondent stated:

> *[It is a] Migration from fossil fuel-based energy generation to cleaner generation but also the upskilling of the workforce in the fossil fuel-based sector to the renewable sector, encompassing the funding that has to come with it (green loans) and ensuring we have a minimal footprint of climate change as a people and ensuring that we save the environment.*

And another stated:

> *The third world acknowledges that we have not caused the problem but gives us money to solve this problem*

And ultimately, the transition will be measured by the economic and social development derived from it.

Unanimously, all the respondents agreed that a transition is necessary, especially with the current trends of climate change. The use of fossil fuels primarily as energy sources has heavily contributed to carbon emissions which affect the atmosphere and evidence is clear.

Additionally, as a member of the global community, there are certain matters the country would need to adhere to.

One participant stated:

> *A transition is necessary. We are seeing the havoc of climate change. In a week you see all four seasons. From that perspective and from the scientific work that has been put in, we have been so dirty and hence now a transition is necessary. And we are part of the global community and what happens in SA won't only impact SA from the atmospheric perspective.*

This participant, like others, thought that while a transition is necessary, it would need to be well thought out before it is implemented. Key points that were mentioned were that a transition would need to be gradual, in South Africa's case that would look like keeping coal in the mix as other cleaner sources are introduced until they equate to the amount of energy generated by coal. In this way, South Africa would not be hurting its energy supply while it gathers its footing. A participant stated:

> *Yes, it is necessary but we need to look at our strong points. Coal is our main source and we have coal in abundance. We can't move away from*

coal entirely but we need to use other sources to offset the emissions. So a transition needs to be strategic.

The transition needs to be customised to the particular community it is catering for meaning not only would it differ from country to country, but it would also differ from community to community within a country. This is because the needs of people in Gauteng are not entirely similar to the needs of the people in Mpumalanga. Likewise, even within one province priorities differ. For the transition to be fair it should isolate the key requirements of those communities and shape the transition in a way that would cater to them

b) There is an unsustainable energy landscape which requires diversification, while effectively utilising South Africa's available resources of the energy mix to ensure energy security

Participants highlighted that due to loadshedding, many businesses have failed to operate at full capacity and others have had to resort to taking loans in order to secure alternative power sources or backup power, particularly the small, medium and micro enterprises such as salons and spaza shops in townships which are struggling, and some have even closed down.

Subsequently, as a result of the struggling businesses, many people have lost their jobs, increasing the unemployment rate. This ripple effect triggers a decline in the economy and becomes a vicious cycle.

One participant stated:

I think the main issue that is being posed by loadshedding is the economic growth of the country is reducing and because it is reducing you have a lot of jobs that are becoming affected. So a lot of people are losing their jobs because production levels have decreased and in turn, has affected economic growth. So from a job's perspective, we're currently in a crisis where the economy is not growing enough to create employment and this can be seen by the employment figures that come out every quarter.

Additionally, the energy crisis has inflicted a decline in living standards as quality of life has deteriorated due to people losing their jobs and failing to afford basic needs and sustain their livelihoods.

Another participant stated:

> *[There is] Social distress from the lack of energy to sustain their livelihoods and their work environments/ getting to work and back under sustainable, available, and cost-effective energy supplies. The element of cost comes in as well which has moved people into thinking outside the box for those that can afford and those that can afford have had to find alternative means of energy outside of the traditional energy sources.*

The interviewees stated that they would like to see a more diversified energy mix by 2050. This would be so that South Africa's dependence on coal decreases – solving some of the electricity issues faced currently. The interviewees called for more renewables in the energy mix, particularly wind and solar to support the decarbonisation of the energy space since South Africa is among the highest carbon emitters due to their extensive use of coal.

Additionally, the coal plants have not been operating at a level efficient enough to provide consistent electricity in the country alluding to the need for alternative energy sources. In addition to wind and solar, the exploration of gas and nuclear was also mentioned. Gas would be used as peaking power plants to assist renewables which would mainly be used for electricity generation.

A participant stated:

> *We have enough energy resources. The discovery of gas in Brulpadda is a promising one in terms of energy security in the country however my biggest concern is around the political interference and will with ensuring the country is secured in terms of energy security. My vision is that by 2050 SA will be stable again in terms of energy security.*
>
> *If we can be able to use the resources that we have around coal and gas would be a good balance – but also around nuclear. Most academics and*

politicians have written off [nuclear] but we need to explore a bit further. SA is a big enough country and has loads of coastal land for us to secure ourselves in terms of nuclear as well. By 2050 SA should be energy secured if we are able to utilise our resources accordingly and for the good of the people.

Emphasis was made that coal should not be completely neglected but only reduced to accommodate other energy sources for reasons such as it being an abundant resource which South Africa should continue to exploit to develop its economy.

I think a 60/50% coal energy sourcing and then you have 40/50% for renewables which then would give us a good base. So it would also allow for good transition in terms of workforce and not killing the markets in terms of the coal industry, economic growth in terms of new renewables coming in, umm yeah, and exploring nuclear I think getting that nuclear as a good 20% would be great and then you have umm the rest with solar and wind.

In addition to this, a key vision would be for the energy value chain to be horizontally integrated to curb challenges faced by South Africa's electricity generator – Eskom.

Although the ratios differed among interviewees, most of them shared similar sentiments around the diversification of the energy mix and reducing coal rather than completely removing it from the energy mix.

This would ensure that there is energy security distinguished by energy equality across the country and the effective utilisation of energy. In order for this to happen, the current energy scenario would need to be resolved. One participant said:

Ceteris peribus – I would think they would find a way to solve the energy problems. But solving the energy problems cannot be diversified from other societal problems since energy is a capital-intensive infrastructure and needs high maintenance to a large extent, so solving an energy problem is equally how the government would provide the money and how

would they be able to bridge the inequality gap. Apart from social inequalities, there is energy inequality. What would the government do with those that currently don't have electricity?

There is a call for the government to intervene by ensuring electricity is equally available across the country regardless of the location or income level of the household. This would be an indication that South Africa's energy situation is becoming more stable. This can be done through increased financial support by the government towards energy projects like oil and gas projects that would assist in diversifying the energy mix, and wind and solar projects that would enable electricity supply to households that are off the grid.

It was highlighted that energy-demand knowledge should be imparted across the country so that households utilise energy effectively and there is no wastage. One participant stated:

It is not a well-addressed topic. Renewables are the way to go. It should be embraced (commercial and industrial) however, the inequality with regards to those who cannot afford the expenses around renewable energy – will a transition cater for them? What is the plan for them to transition –smaller-scale renewables?

And to me, the most important is the energy- demand education knowledge – how do we consume the energy we have? Most of the time we think we need more but I don't see the energy economics playing out on a daily basis – people finding out how much they really need without wasting it. If renewables will solve the problem It needs a different mindset on consumption. But I see South Africa making the necessary adjustments to adopt the electricity and other energy mix to serve the purpose.

Through providing knowledge about energy efficiency and promoting optimal consumption of electricity, society would be able to utilise less by avoiding wastage that arises from unnecessary electricity use like using fans and air conditioners rather than opening windows, using heaters rather than layering, etc. and using energy-efficient appliances and electronics.

4.1.1 *Conclusion of Research Question 1 findings*

Two themes emerged from the first research question. These are:

a) The JET should be strategized to ensure fairness by accommodating the poorer communities and those directly benefitting from coal
b) There is an unsustainable energy landscape which requires diversification, while effectively utilising South Africa's available resources of the energy mix to ensure energy security

The first theme indicated that the Just Energy Transition was indeed necessary and should focus on all levels of society, however, it must be strategized to accommodate those most affected by the transition such as the poor and those directly affiliated with the coal industry. The second theme highlighted that there was a notable energy crisis in South Africa which required a call to action. It further suggested an energy future that was made up of a more diversified energy mix but without foregoing South Africa's readily available resources such as coal and natural gas.

4.2 Research question 2: What are the important social factors to be considered during the transition?

This section discusses the findings and themes resulting from the second research question (What are the important social factors to be considered during the transition?) Results depict several factors that require attention during the transition however a majority of the respondents emphasized the role played by the government which has led to the economic decline of the country depicted by the high unemployment rates, increased inequality, and growing poverty rates.

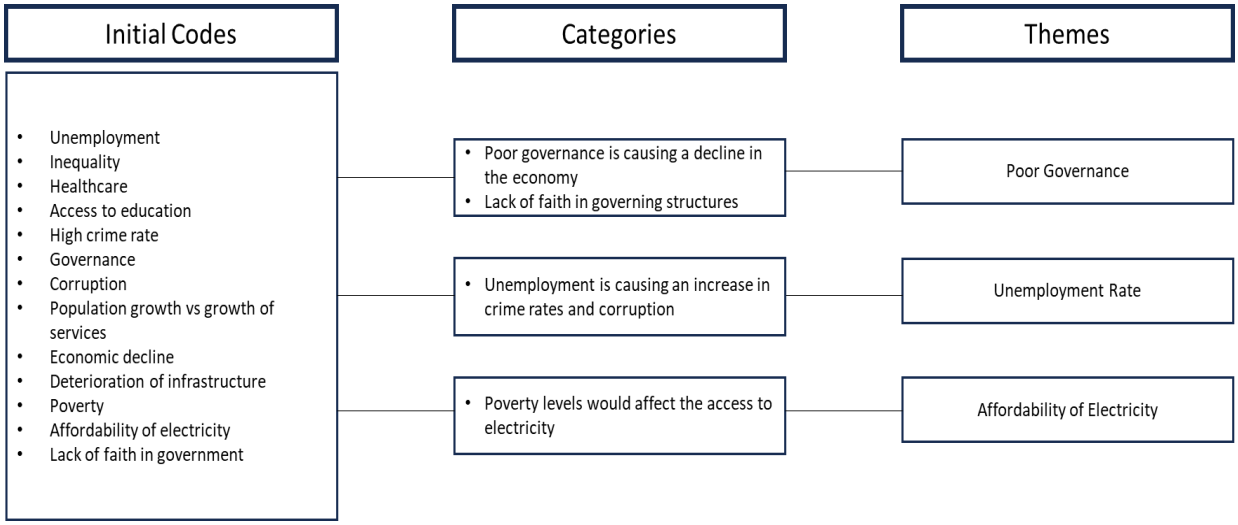

Figure 8: Findings on Research Question 2 from semi-structured interviews

Three themes that emerged from Research Question 1 are a).Poor Governance, b) Unemployment Rate and c) Affordability of Electricity. These are discussed below.

a) Poor Governance

Respondents displayed a lack of faith in leadership to solve the problems the country is currently facing.

One participant mentioned:

> *We have serious governance issues. Once governance is not in place, there is a general collapse of social support system. The social support system then becomes the bigger gap between the poor and the rich, the haves and have-nots. In as much as SA has always been known for being one of the most unequal countries in terms of the economic spread, it's getting worse – what does that do? The economy doesn't perform – there is a lot of unemployment – many people on the street …what are they doing? There is a lot of briefcase tender-preneuers that comes with corruption and then the money doesn't get into the proper system, infrastructure deteriorates, health infrastructure is almost collapsing, etc.*

Through this perspective, a majority of the problems the country faces stem from poor governance. When leaders make better decisions and follow through on implementation, there is a chance for development.

Another mentioned:

> *There is a serious lack of government commitment to driving the objectives and policies around the energy targets that they require in terms of being able to sustain the environment and the economy and meeting the commitments towards the transition from dirty towards green energy.*

It would be instrumental to see the transition spearheaded by local companies rather than foreign multinationals. From sourcing to manufacturing to installation and maintenance, the Just Energy Transition needs to be largely carried out by South Africans which is dependent on the policies set forth by the governing structures. That way, the money circulates within the country.

> *So the transition brings in these new technologies like your renewables so I would want – there has to be proper localisation. How do we localise as a country, making sure that we create a value chain. Instead of us importing all these things we need to create a manufacturing and production value chain.*
>
> *Mining to manufacturing to the end products so there has to be that opportunity from the country and not only just we're going to buy everything from China and all we do is we are installers. No, it should actually create a local industry, create a new value chain for the country. This needs to be embedded in the policies*

b) Unemployment Rate

Of all the factors mentioned as most prominent in South Africa that should be considered during a transition, the most frequently mentioned was unemployment. The country faces a high rate of unemployment with many qualified youths failing to secure jobs. This in turn has resulted in other challenges such as increased crime rate, inequality, corruption, and poverty.

One participant stated:

> *Unemployment is a big issue. So many youth are idling at home and their favourite pastime is alcoholism. We are seeing an increase in crime and corruption because of this.*

While another stated:

> *I would say unemployment should be deeply considered. Because already this is something that is going to take away jobs. Can we really be sure that the number of jobs taken away will be enough to re-hire those people and create more? I don't think so.*

And another participant stated:

> *It's definitely unemployment. Thee are fresh graduates each year and no jobs for them to go to?*

Respondents mentioned that the JET should bring forth new opportunities for people to become employed in the country particularly the black community who have been dealt the lower hand for a long time. Currently, there aren't a lot of black people at the forefront of the transition either streamlining the implementation or creating businesses that would aid in its implementation which needs to change. One of the respondents mentioned:

> *To build SMMEs around the RE sector. There aren't a lot of black people participating in the transition. Rather it's the former oil and gas transitioning into electricity companies.*

Large oil companies like Total, Shell and BP have been making strides towards Renewable energy. While good for the environment, it doesn't necessarily help with re-skilling and upskilling of the affected communities. The black community should leverage the transition to create small, medium and micro enterprises that deal with manufacturing materials or even impart knowledge about the JET so as to uplift their communities. Additionally, since new skills will arise during the

transition it would be viable for individuals to attain the necessary skills required to qualify for such jobs. One participant stated:

> *There has to be job creation, skills development – all of your support services would arise from there so your accountants, your technicians for maintenance, your funding structures for institutions, R & D might also be there, our mining would also be bolstered and new group metals since we are the biggest producers for those metals and they are necessary for battery storage.*

Leveraging all these opportunities and increasing the employment real will improve the quality of life of South Africans as more individuals will be able to afford basic services and other necessities. A quotation illustrating this states:

> *Employment opportunities because that improves the quality of life- able to afford good healthcare, housing, energy, education, etc.*

c) Affordability of Electricity

With the poverty levels constantly increasing, and the inequality gap getting wider, respondents highlighted that during a transition, there needs to be a focus on the cost of electricity.

One participant stated:

> *Already, so many people cannot afford electricity and are stealing from the grid. In order to stop these crimes from happening and to help these people, the price for renewable-generated electricity needs to be affordable for them so they don't look for other means to access it.*

While another stated:

> *Poverty levels are increasing with the growing unemployment. And we know that the cost of installing solar plants are very high. To me, that seems like the cost of electricity generated through solar will also be high. And once that happens the transition is not going to be fruitful.*

Additionally, the respondents mentioned the rate of population growth; it is growing at an exponential rate compared to the growth of the resources to cater for this population. This then causes a strain on service delivery and living standards.

A few participants highlighted deterioration in healthcare, water, housing and education services. The following quotation illustrates this point:

> *Healthcare – many people do not have access to healthcare facilities especially in the village or those that [do] have healthcare facilities are substandard. Access to education is becoming an issue. It is difficult to get your child into a public school because the schools are overpopulated. Land issue – Deprivation of land by [a] government who is failing the people. If people had access to land, they would be able to help themselves e.g. farming.*

Respondents further highlighted an absence of efficient service delivery characterised by dirty streets, absence of clean water in households, lack of responsiveness to needs and untimely service delivery. Though there are various reasons for inefficient service delivery, the energy crisis does contribute in one way or another. This is because, without consistent electricity, production is affected.

> *I would like to see a sense of community growth in terms of committees being developed and companies actually and these companies, all these developers and who are doing these energy transitions and government actually you know providing proper service delivery in terms of the energy sector – proper service delivery. Essentially, I'd like to see better living standards.*

Communities are at the core of our societies and it is important to take care of them for our economies to grow. Efficient service delivery will result in a boost in the economy through a ripple effect from the availability of basic needs that support an individual’s development. Rather than spending most of their time

searching for water, electricity, and food, most of their time can be allocated towards productive activities such as school and work.

However, others shared different sentiments with the other respondents, particularly with regard to the alleged job creation that the JET would bring forth. A quotation illustrating these states:

> *I don't believe we're going to create a lot of jobs of the transition. Honestly. It's either gonna be a trade off in terms of of reskilling. And if there's no trade off in terms of risk killing and there's going to be new employment and, redundant employment.*
>
> *So I think the equation balance is out and in that regard in terms of in terms of that benefit, umm, the only benefit that I see from the transition is umm in increased element of more energy uh becoming available which talks to security? Yeah, the energy security status, you know, just improving and that's what I can see. But in terms of all other aspects I don't, I don't see a drastic it drastic change around the transition.*

Because renewables will replace most of the coal-fired plants, the jobs created would merely be taking over the jobs that are no longer required and not necessarily creating more employment opportunities.

4.2.1 *Conclusion of Research Question 2 findings*

Three themes emerged from Research Question 2 which aimed to identify the important social factors to be considered during the JET. These are:

a) Poor Governance
b) Unemployment Rate
c) Affordability of Electricity

These themes indicated that while there are many factors affecting society, there are three that need to be prioritised during the transition. Governance is the core of these issues since the policies made and the implementation of those policies play a big role in how the transition takes place and how society is affected.

Additionally, with the pace at which the rate of poverty and unemployment is growing, the Just Energy Transition needs to factor in how it would cater to the poorer communities who cannot afford electricity such that there is development in all spheres of society.

4.3 Research Question 3: What strategies can be implemented to ensure the inclusivity of society during the transition?

This section discusses the findings and themes resulting from the third research question (How can the inclusivity of the society be ensured during the transition?) Results depict that there are several factors that need to be considered to ensure the inclusivity of the society.

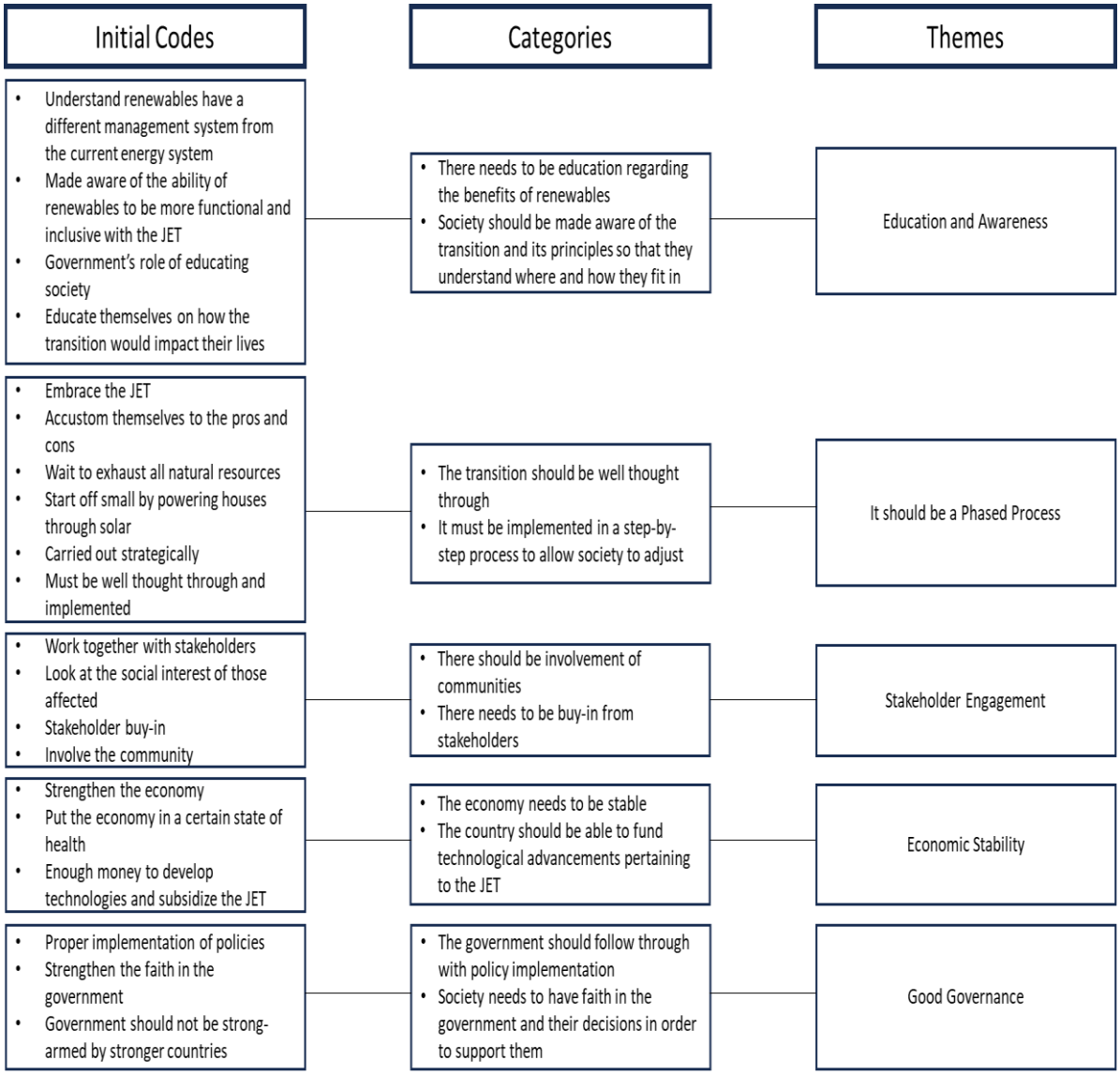

Figure 9: Findings on Research Question 3 from semi-structured interviews

Five key themes emerged from this research question, namely a) Education and awareness b) It should be a phased process c) Stakeholder engagement d) Economic stability and e) Good governance. These are discussed below.

a) Education and Awareness

Respondents agreed that in order for the transition to be inclusive, society must understand what it entails before it is implemented. The transition would bring a new way of doing things which likely would cause disruptions in the day-to-day lives of the people, hence education is crucial for one to adapt to such changes. One participant stated:

Society has to understand that renewables have a different management system from the current energy system. Hence people need to be ready to take responsibility for it. Society has to be made aware of their ability to become more functional and inclusive with this transition.

While another stated:

Society needs to understand that it involves a lot of things – with deregulation everyone gets to generate according to their need. And with decentralisation – not everyone can be short of power at the same time in a transitioned society since the energy is decentralised. Digitalisation – makes control of consumption more manageable. Democratisation makes people understand what works for them and congregates their efforts to that.

Another respondent mentioned:

People would need to know how to change their routines and operate in a way that is financially viable for them. For example, if using solar energy to power one's household, how can one change the time they wake up to get ready for work and school? Are there storage options to ensure the supply of electricity during seasons when the sun is scarce? How much more or less will one be spending to power their entire household?

Education and raising awareness about the concept to society is critical so that it is easily understood and adopted. The transition is prone to resistance since it will take people out of their comfort zones from their daily routines to their overall activities. Hence it should be publicised more and even taught in schools to allow younger learners to understand it, and in doing so potentially pave their education choices to be in line with careers that can spearhead the transition locally. Quotations to illustrate this include:

I believe the right place to start is not at the high societal levels – it should be started at the creche and form part of the curriculum and get people to understand what energy use and other components of it – recycling, water

use, etc. JET as it is should form part of the education curriculum so that people do not resist it too much.

Another stated:

If it is a transition, let's say if you go in from coal to renewables, so that community needs to know how the current skill set will then be transferred into this new kind of economy. I think if it's clear and the community sees the benefit on how they're going to be, that's going to affect in a positive way and then I think it's easy then for this transition to occur.

b) It should be a Phased Process

Some respondents voiced that there is no need to rush the transition. Despite there being global requirements South Africa must prioritise its people. The transition should be phased and should begin by first acknowledging that a transition is a major financial undertaking which, without a stable economy could cause a further collapse.

It would be prudent to utilise the present natural resources more efficiently and effectively as the country positions itself better to go through a transition. A quotation illustrating this includes:

If it were in my hands, I would wait. I would wait until we have exhausted all our natural resources. Or at least until we have increased productivity, GDP and all of that for the country before we start looking at renewables. Remember that the cost of transitioning is still quite high because the technologies themselves are still very high. However, because we live in a global village, there is a need for whatever we export to be produced from some low carbon sources.

Another stated:

It should not be a rushed process. Maybe start off small by looking at how do we get houses in South Africa powered by solar? And you know, I just read about Southern Australia. They have 3.5 million houses and all these 3.5 million houses have solar, so at a particular time during the day. The

houses themselves can meet the demand of the region, so I would really look at it at a low scale. How do we get houses to have solar? How do we create this excess energy before we even think big, like the hydrogen market and all of that, and still make sure that the fossil fuels that we have, we use them adequately and we manage them process.

One participant said:

If it's well balanced it should have a positive impact but currently the industrial aspect of this transition is based in China. How does it help SA importing invertors and solar panels? We are promoting transfer prices that hurt us at the end of the day since the jobs are not here. There are no companies manufacturing invertors, etc.

The transition needs to be well thought through and implemented through a phased approach which targets communities according to their core requirement since these differ from one community to another. One participant alluded to this through the following statements:

Identifying the felt need of the target group – need from MP is different from the need in WC. The felt need is that that addresses the most important issue that the community/ society is facing. It is not okay to impose a solution but first find out what is their felt need. To some it's lighting that is important to them while others it is industrial , others it is their ability to access the internet since in some areas there is a concentration of certain activities e.g. in Gauteng – a concentration of internet facilities makes the internet a sine que non so JET would have to figure out what a society needs and not impose a curated solution on society. It needs to be done at a different pace across South Africa. Lanes should be defined and necessary support should be given.

Another participant said:

It's difficult to draw a line between whether it's going to solve or make it worse. There is a very fine line between what the transition is going to bring. It's going to bring new things but it's going to be a shock. You need

to put an economy in a certain state of health for you to move on to the next stage which is where we want to go of an energy transition. Up until you are okay where you are, trying to adapt a level higher on anything will come with its own challenges – even shake the base that you are currently standing on which could make things worse. E.g. transport sector which is trying to be solved by use of taxis. Taxis use fossil fuels. A transition now would cause a major disruption and people will sit on the fence.

A JET, while possessing good intentions is a resource intensive undertaking which requires a strong economic base. South Africa faces economic, political and social challenges that do not directly coincide with its energy issues. While the country's energy crisis requires urgent solutions coupled with the global political push for transitions, it should not be undertaken rapidly such that other pillars are broken.

c) Stakeholder Engagement

A transition will be fair if it incorporates the views and opinions of the larger population across all levels. For example, understanding society's pain points to shape the transition in a way that will accurately solve those problems, as well as their strengths to leverage during implementation. Investors and other key contributors would also need to be well-informed throughout to gain their buy-in. For this to happen there needs to be stakeholder engagement and management. One participant stated:

Change is not the problem. The problem is transition. People resist transition because it is what they do not understand. They accept what they understand and condemn what they do not understand. Efforts should be made to acquaint people with the JET

While another stated:

Awareness (across the board from the layman on the street to the senior most person) should be considered. A lot of people do not know what is going on in the country. Awareness in terms of the transition. It is not easily

accessible information. If people knew more about what it would do for them, they would rally more and support the transition.

The rest of the participants believe that without stakeholder buy-in the JET would fail. Involving the whole society and getting them on board would avoid any barriers to its implementation because their views would be identified and considered as decisions are made. A participant stated:

> *Absence of proper stakeholder mapping and engagement and not carefully focusing on each and every stakeholder group during the transition would cause it to fail.*

Another stated:

> *Not involving the community and people. When you [are] introducing technology or these new solutions or any solution, it needs to be practical to the environment, to the area, to the people that it will serve. So, like with rural development, the off-grid solutions are really great, but people need to understand this before you go and implement them.*

Another participant stated:

> *You need stakeholder buy-in. Simple. Otherwise, you might have a transition, but it won't be just.*

One participant acknowledged the importance of stakeholder engagement, but also admitted that it wouldn't make much of a difference. They stated:

> *Stakeholder engagement is nice, it's important yes. But one thing people don't think about is whether what said stakeholders say will actually be considered. It shouldn't be a case of okay, we heard you, but we don't care what you said because it doesn't align with what we want. You can't please everybody, and at the end, things need to get done.*

And another participant stated:

Taking certain elements or solutions that are not practical and taking solutions that are not practical to the society and implementing them will fail. You need to study the society you're implementing in.

d) Economic Stability

The transition is a project that undoubtedly requires high capital to implement. Currently, South Africa's economy has been declining due to the effects of loadshedding and other factors. Some of the respondents believed that going through a transition while the economy is unstable would only cause it to fail. Quotations to illustrate this include:

Energy is capital intensive project. Transition is easier in a thriving economy. Once at macrolevel things are not as they should be it is a clear indication that it will fail because it has to be built from top down.

While another said:

There has to be money in the society to develop certain facilities and subsidize certain uptake of JET approach especially when you're talking of the social aspect of it- majority of the population is the youth, when you combine youth-unemployment and inequalities how do we solve the problem? Efforts should be towards growing the economy so we can solve the existing problems and those that would develop in future.

Another participant stated:

There is a writer who called South Africa a 'failed state' because the economy is declining. Now we want to somehow bring in all these new things. How will we fund them? We need to stabilise our economy first before we undertake projects that could bleed ourselves dry.

Another one stated:

I don't think it's our biggest problem. The issue is the economy. Once the economy is strong and climbing we can sit down and talk about the energy

matters. Large corporations like Transnet are going bankrupt and we want to give them energy. How will they afford that energy?

While another stated:

> *Let's face it, the people don't really care about what the world wants. What the geopolitics want. They want something that makes sense to them financially. If you tell me you're bringing in these major changes that are going to cost a fortune for me to adopt, I'm going to say no. There need to be incentives, there need to be grants and these things take time.*

Fairness would be achieved if it prioritises capacity building such that it equips society with the necessary tools and knowledge to adapt to it. The technology used for renewable energy should be manufactured locally which would aid in creating more job opportunities. A participant stated:

> *The industrialisation of the RE energy sector within the country would make it fair.*

Rather than sourcing solar panels and other materials from China, South Africa should develop the capacity to manufacture so that it benefits its people. Additionally, while renewable energy is being developed, current energy sources should not be completely left out just yet.

> *Leave others as they are and increase capacity for solar and other renewables which would create new jobs. Then the plants that would be decommissioned - you can reskill and upskill. It should be a slow adoption towards cleaner energy and it must be very strategic and should do as little damage to the communities that are benefitting from coal.*

Another quotation to illustrate this is stated below:

> *Up until we have achieved a certain level of economic and political maturity it is very difficult to move from point A and point B. We can say consult but that will not give enough solution/ cushion because how then do we implement? Do we implement along the lines of the consultations? You will be caught with 'yes; we can transition but these are the conditions.' I think*

we have bigger problems/ issues and until we solve them can we only have meaningful dialogues around the transition.

e) Good Governance

However, there is a major role the government has to play to ensure that this education is imparted as they are at the forefront of the JET. This involves making sure information and knowledge pertaining to the transition are readily available. A quotation illustrating this includes:

Can't speak about society without speaking about government because the doorway into participation usually falls around policy and regulation. If we were to draw up regulation that would promote the participation of society within the sector that would help.

I could say society needs to educate themselves but one of the issues society faces is access to education so if society can't afford to get access to education in and around the sector that is a challenge.

Another stated:

At the end of the day, the government has a big role to play for example beneficiation – we are exporting the iron ore that is used to build panels and other products. Society has a big role to play but society without government is powerless.

Good Governance is essential for the development of a growing economy since it ensures resources are allocated timeously and efficiently. It discards the existence of elements like corruption and mismanagement of resources which have been prominent among South African leaders. The JET can be fair if there is good governance that will prioritise the needs of the people. A starting point for this would be the implementation of the policies that have already been drafted. A participant stated:

…As stated in the energy policy, those factors that are stated in the energy factor are really important. I mean we have about more than 80% electrification. So if you follow our policies, those policies have highlighted

really great key factors and if we use those as a guide and we don't deviate from them, then we will be on a great transition.

Policy and legislation need to not only be well articulated but must be followed through with proper implementation. Some quotations alluding to this include:

The policy matters. At a national level the biggest threat is failure to use our current resources for the good of the country. For example lack of regulation and legislation to utilise gas in Bruppalda.

While another stated:

Absence of an implementation plan which would speak to investor involvement and engagement, community involvement and engagement to see how they can participate and benefit from all of this would cause the transition to fail.

And another said:

People are losing faith in the government. We have seen things written on paper, but where is the implementation. It's like a barking dog that has no bite.

Another participant stated:

The issue is corruption. We've seen it too many times. I'm not adverse to the plans that are in place but do we ever see them come into fruition? It seems like another scheme to use taxpayers' money for personal gain.

And another participant said*:*

I mean, what also could cause the transition to fail is say for instance I think it was Germany and some of the European countries. They closed down. They closed down their power plants and now they're restarting them, but they want South Africa to close down their power plants and export our coal to them.

That will cause the transition to fail, you know, because now you've literally taken, like our baseline in terms of energy and you've killed it for

renewables, which aren't really extremely consistent, obviously with certain elements like battery storage, they give a better consistency. So the government can't be strong-armed into doing such things to stay in the good graces of the stronger countries.

And another stated:

Great leadership. I mean everything you know if it's not led, right, it will fail. China made the decision not to close down their power plants or their fossil fuel power plants, and they're still running on that.

But they're also running on renewables, so they have a really great energy transition plan that is working for their people, so great leadership ultimately even with Paul Kagame in Kenya, I mean you see what great leadership does for a great transition you know.

Another participant attested to the role that good governance and proper implementation of policies would have in making the JET truly fair to all. However, it is not a one-time fix, but an ongoing endeavour. It's about building trust, fostering collaboration, and holding power accountable. Only with such a robust framework can South Africa's energy transition be truly just, leaving no one behind in the race towards a clean and equitable future.

Collaboration and cooperation between the government and society is critical. There needs to be a bottom-up view of strategizing for the transition in order for inclusivity to be present.

And another said:

The policies are there, the blueprints are there. They come out in numbers, investors come out in numbers, so the will is there, but there is no implementation plan. Implementation plan will talk to investor involvement and engagement, community engagement and involvement. Even to bring them to see how they can be benefitting and participating in this and we're not there.

4.3.1 *Conclusion of Research Question 3 Findings*

Five key themes emerged from the third research question which are:

a) Education and Awareness
b) It should be a Phased Process
c) Stakeholder Engagement
d) Economic Stability
e) Good Governance

The first one advocates for the importance of education and awareness so that society understands what the transition entails before its deployment. The second one emphasises that the transition should be gradually adopted through a phased approach. The third one speaks to the importance of stakeholder engagement during the transition. The fourth one attests to the criticality of the economy being stable playing a crucial role in the energy transition and lastly, the importance of a good governing structure to spearhead the transition.

4.4 Data triangulation

Triangulation is using multiple methods of data sources in qualitative research to develop a comprehensive understanding of phenomena (Triangulation, 2014). It further establishes credibility and validity (Saunders, 2015). This study used triangulation based on government documents such as reports, national addresses, frameworks and plans to compare with the information obtained from the interviews.

The table below shows data triangulation in comparison with information obtained from the interviews.

RSA Government Document (source)	Document Description	Issue	Comparison to Interviews
SoNA 2023 Highlights (Government of South Africa, 2023)	Constitutional Obligation in which the President reports on the status of the country, and unveils the government's agenda for the coming year, proposing certain legislative measures to Congress	The address declared the current energy crisis as a 'national disaster' due to its effects on the economy and society, particularly highlighting: • Loadshedding • Unemployment • Poverty • The rising cost of living • Crime and Corruption	Participants unanimously agreed that there was an unsustainable energy landscape in South Africa depicted by loadshedding and the number of businesses that have had to due to unstable electricity. This in turn has increased the unemployment rate, increasing poverty levels and crime in society. This is aligned with the comments made in the State of Nation Address

Integrated Resource Plan (DMRE, 2024)	Legal instrument for an electricity generation plan that meets forecasted annual peak and energy demand through a combination of supply-side and demand-side resources over a specified future period	The report highlights the need for a diversified energy mix that will ensure the security of supply while complying with the emission reduction plan through the incorporation of cleaner energy sources	The participants indicated that a diversification of the energy mix was critical to ensure energy security and to adhere to global efforts to mitigate global warming
Stakeholder Perspectives on South Africa's Just Energy Transition Investment Plan (Presidential Climate Commission, 2023)	A report highlighting the stakeholder consultations programme which aims to: • Gather input in terms of the country's future electricity mix and energy security.	Key messages that were highlighted were: i. Procedural fairness: Timely and inclusive sharing of relevant information is a critical success factor	Several participants emphasised the importance of stakeholder mapping and engagement during the transition as well as the inclusion of all members of society. Additionally, emphasis was made on the affordability of energy since many people currently struggle to afford or access electricity – the transition must accommodate such people.

	• Build trust and understanding between parties. • Understand the principal elements of the JET. • Establish a consensus regarding the principal elements of a set of recommendations on incorporating climate change into energy investment and electricity planning in SA	ii. for all consultations iii. and dialogues. Thorough stakeholder mapping and inclusion are critical. The affordability of energy remains an unresolved issue which requires a collaborative approach among all social partners.	This aligns with the comments recorded in the plan enhancing credibility and validity.

		The document highlights three principles that should govern the just transition: • Distributive justice • Restorative justice • Procedural justice	Participants mentioned the need to reskill and upskill workers which forms part of distributive justice. They mentioned the need to shift from fossil fuels to cleaner energy sources in an effort to stop climate change which forms a part of restorative justice. They mentioned the need to collaborate with communities that will be most affected by the transition to ensure decisions are made with the pain points of these communities in mind. This is aligned with the report.

CHAPTER 5. DISCUSSION OF FINDINGS

5.1 Introduction

This chapter discusses the qualitative study findings within the context of the literature review conducted in Chapter 2, integrated with the findings in Chapter 4. The three research questions are discussed per section.

5.2 Research Question 1: How do Postgraduate students understand the Just Energy Transition and what is their perspective on it

This section discusses findings arising from the first interview question which aims to understand the perspective of postgraduate students towards the Just Energy Transition.

The findings indicated alignment with the literature review regarding the Just Energy transition. Results indicated that the general understanding of the Just Energy Transition was that it is a transition that should be strategized in a way that ensures fairness by accommodating those most affected by the transition who are the poor and those directly affiliated with the coal industry whose jobs might be made redundant after the implementation of a transition.

According to the Presidential Climate Commission (2022a) Presidential Climate Commission, the Just Energy Transition must ensure that the communities whose livelihoods are tied to high-emitting industries like coal are not left behind in the transition to a more sustainable economy.

The findings supported this remark as it was indicated that for a transition to be fair and just, it should cater for poorer economies and those at the bottom of the food chain who might not be able to afford cleaner energy sources. The PCC's framework for a Just Transition supports this by acknowledging that at least US $10 billion should be allocated towards 'climate justice outcomes' to support

workers and communities in the transition through compensation, retraining and relocating, among others (Presidential Climate Commission, 2022a)

Both the findings and literature agreed on Africa's contribution to climate change, with the results indicating that Africa has contributed the least to global emissions. African Development Group Bank (2022) recorded that despite Africa inhabiting 17% of the world population as of 2022, the continent had only contributed an insignificant 3% of cumulative global carbon dioxide emissions. However, this has resulted in major consequences for the African population whose economies are highly dependent on agriculture.

Hence according to the findings, the transition is a necessary endeavour, though it should be approached with caution. Findings acknowledged that although South Africa, and Africa at large is not a major cause of climate change, the impacts will not only affect those who have highly contributed to it, but the entire world and this is evident in the current weather conditions. Igamba (2023) indicated that mean annual temperatures have increased in South Africa by two times the global average and this has been apparent through the increase in hot and cold extremes, with heat waves more frequent, decreasing crop yields and food insecurity rising.

It should however be a gradual process that considers the differences of each country and is cognizant of the different geographical and economic environments. Prime Minister Narendra Modi stated that there is no one-size-fitsall solution to an energy transition given that countries are on different pathways (Energy World, 2023).

This also means that diversity should be implemented in the energy mixes of the countries. This statement aligns with the findings where it was mentioned that South Africa should keep coal in its energy mix, while it introduces other energy sources into the energy mix. During the Minerals Council Tech and Innovation in Coal Webinar, it was mentioned that coal still plays an important role in meeting global energy demands and is crucial in building societies (Anglo American,

2020). As such, its presence in South Africa is vital, even as the country pushes to transition to cleaner energy as it will facilitate baseload power generation.

A key point to note from the findings was the emphasis that while it is understood that the transition would differ from country to country, it is crucial to realise that it will also differ from community to community as there are different pain points across the country. As such, what might work in one province might not work in another, and even within the provinces, differences might be present.

5.3 Research Question 2: What are the important social factors to consider during a transition?

This section discusses the findings arising from the second research question which aimed to identify the important social factors to consider during a transition.

Findings uncovered several factors including unemployment. This was a largely discussed factor especially since South Africa's unemployment is currently growing due to the economic decline. With the deployment of an energy transition, many jobs would be made redundant, increasing the unemployment rate. O'Neill (2022) highlights the growing unemployment rate in South Africa evidencing the issue. National Treasury (2021) noted that the formal labour market was not showing any signs of recovery post the 2019 pandemic where the total number of employed people declined consecutively for two quarters with the number of jobs remaining 1.5 million below pre-pandemic levels at 14.9 million.

The literature argues that the just energy transition would create new jobs, alleviating the unemployment rate in the country. PwC (2021) further calculated that it would take approximately a decade for the employment rate to return to the level it was before the pandemic. Some researchers are hopeful that the JET will create the jobs, with the Department of Energy (2019) approximating a netpositive 35000 jobs would be created. The findings align with this hope of job creation in an effort to reduce unemployed youth and sustain those whose jobs would be affected.

Some scepticism was recorded as well, because the jobs that would be created would only replace the ones made redundant, cancelling each other out which implies that no new opportunities would be created. According to Burger (2023), the replacement of jobs will still leave a 33% unemployment rate indicating that other methods would need to couple the alleged job creation such as economic diversification. Reskilling and upskilling would also need to be prioritised in the most affected communities.

Unemployment is coupled with inequality and poverty – two factors that stood out in the findings. South Africa has become a country where the income inequality gap is gradually increasing. Findings indicated that the energy transition would need to consider the affordability of the new technologies so that those at the bottom of the food chain will be able to afford it. The World Bank (2017) offers that without access to electricity, the pathway out of poverty would be elongated since energy is linked to other crucial social factors like health, education, and food security.

(Oyuke et al., 2016) recorded electricity as a key driving point for success in this age, as it facilitates a child's ability to study, or attend school and enables business owners to conduct their activities efficiently so that they have a chance at succeeding. Hence if we are to disrupt the currently not-so-great electricity situation by altering the energy supply, these factors will be on the minds of the community. If the new energies do not improve the current situation, resistance will be met.

Sarkodie and Adams (2020) highlight the role affordability has played in hindering the scaling up of electricity through renewable energy. Although decentralisation of the energy system would serve as a cost-effective measure of improving electricity access, the upfront cost of most off-grid energy systems is too high for what the average consumer is willing and able to pay. The findings support this observation, with respondents alluding to the transition failing if the layman on the street cannot afford these new technologies.

Some of the respondents emphasised that, while the social factors are extremely important, one cannot speak about them without mentioning the government, who are key decision-makers and policy makers. An absence of proper governance was prominently mentioned, with respondents showing a lack of faith in the governing structures due to poor implementation of policies, corruption and the economic stringencies that couple the country. Sarkodie and Adams (2020) support the concept of good governance being critical to warranting energy security.

Keefer and Scartascini (2022) further illustrate that an absence of faith in the government can cause a lack of responsiveness to the policies made, even if they are favourable to the citizens. A transition offers the promise of better living conditions, more jobs and a more stable energy landscape, but it simultaneously creates a new risk of exacerbating trust issues if not well implemented especially if society does not feel like they are in control (Barometer, 2024).

5.4 Research Question 3: What strategies can be implemented to ensure inclusivity?

This section discusses the third research question, aiming to understand how the respondents felt would be the ideal approach in attaining a truly just energy transition.

Findings illustrated that in order for the transition to be inclusive of society, stakeholder engagement is of the utmost importance. This allows the government and other key decision-makers to understand the pain points across the various communities and incorporate them as they structure their strategies. People cannot accept what they do not understand and likewise, they cannot accept what they feel is beyond their control.

The Presidential Climate Commission (2022b) recognises the need for stakeholder engagement in identifying the main risks that may be posed to society and promoting social inclusion. They highlight three key principles; distributive justice, restorative justice and procedural justice which align with the findings.

Communities would need to understand what a transition means for them, and how it would change their everyday lifestyle which is covered in procedural justice. Here, the government should empower the people to find their place in the transition be it through the creation of SMMEs that produce the materials required to facilitate a transition or through restructuring their lifestyles to fit the new reality. For this level of understanding to exist, society needs a platform to voice their grievances beforehand, so they can be tackled efficiently and effectively, as intended by the principle of restorative and distributive justice.

In order to accurately voice their concerns, a clear understanding is required. Some respondents had no idea of the concept of the Just Energy Transition, emulating a knowledge gap between those in the energy space and others, insisting on the importance of education about the transition.

Findings stated that education should be started from creches and kindergarten so that children understand the importance of energy, how to use it efficiently and why we need to find cleaner sources of energy. This would also inform the paths that scholars take in their education so that experts are not always imported, but there is a localisation of expertise.

This should be coupled with campaigns and initiatives to equip society with the skills and knowledge required to survive an energy transition in a way that no one is left behind.

The findings also mentioned that with an unstable economy, policies might be formulated but will not be implemented and that is where the transition should start – with stabilising the economy first. The transition is financially intensive and requires a lot of capital to undertake. While the economy gradually recovers, the transition should be adopted on a phase-by-phase process.

The phases should be informed by where and how, according to the findings.

As for where, research should start from one community to another, understanding their key pain points and devising a strategy that will work for them before moving to another since the transition is not a one-size-fits-all solution.

Acknowledging the differences desired by various communities will ensure an inclusivity of social factors.

Likewise, the transition must be gradual in terms of how changes to South Africa's energy mix take place. Time is required to reskill and upskill those that may be affected by a transition hence it would be prudent to leave coal in the mix while these activities pan out. In order for South Africa to benefit from it, the entire value chain would need to be localised which again requires time, money and expertise, hence while these are being gathered, the energy mix must not be tremendously altered.

Narayanan (2023) enforces these recommendations arguing that a gradual transition would be the more sustainable option, since a sudden transformation to renewables would cause more harm than good, particularly in developing countries that are already battling energy crises. A transition period is required which would involve understanding renewables and gathering the finances to fund them, while also upholding investments in fossil fuels in order to keep the lights on.

5.5 Conclusions

The findings established that the Just Energy Transition is one that was strategically implemented, such that it ensured fairness by accommodating those that would be most affected by the transition. This refers to the poor and those directly associated with the coal industry. This understanding was in alignment with literature which stated that people whose livelihoods were tied to the coal industry, or similar industries must not be left behind during a transition.

Further, there was no doubt that an energy transition was required due to the geopolitical implications, as well as the evident climate change conditions which demanded immediate attention – however, the implementation of the transition needed to be strategic and well thought through.

The most critical pain points that needed to be considered during a transition included the unemployment rate in South Africa. A transition would need to make provision for those who are currently employed in industries that would be made redundant through a transition, while also creating more jobs to reduce the unemployment rate. Both the findings and literature emphasise re-skilling and upskilling.

Poor governance is also mentioned as a factor requiring strong attention since the government will be responsible for spearheading the transition. Currently, there is a lack of faith in the governing structures as they lack follow through of stated policies. The economic decline also increases the scepticism of people towards the government's ability to successfully implement the transition.

Lastly, it is paramount that the transition brings technology that is affordable to the lowest-earning income recipients of society otherwise it would be difficult for it to take off.

The approach that Postgraduate students revealed as inclusive emphasised imparting awareness and providing education regarding matters of energy at large and the transition. Society cannot accept what they do not know. This goes hand-in-hand with stakeholder engagement which would allow the stakeholders responsible for implementation to truly understand what different communities require and incorporate those needs in the strategy. The literature review also identified stakeholder engagement as a critical element in ensuring a fair energy transition.

The findings strongly stated that in its current state, South Africa's economy is not stable enough to undergo a transition. Measures should be put in place to build the financial standing of the country including alleviating critical issues like unemployment, poverty and the inequality gap. Thereafter, not only will the country be able to implement a successful energy transition, but its people will also be able to fully embrace it.

This means that the JET should be a gradual process. It should be done in phases on a community-to-community basis to allow enough time to understand the

community as well as let the community understand the process, giving them time to adjust. Further, phasing in terms of the energy mix whereby findings emphasized that coal, as South Africa's most abundant resource should be kept in the energy mix until the country has the capacity to function on renewables.

This is aligned with the literature review.

CHAPTER 6. CONCLUSION & RECOMMENDATIONS

6.1 Introduction

This chapter integrates findings into the original research questions as outlined in Chapter 1. It further provides recommendations to the stakeholders involved in the transition. This includes general members of society, the government and investors.

6.2 Research Question 1 Conclusions

The first research question investigated Postgraduate students' understanding of the JET. The findings outlined that an energy transition was required due to the events caused by climate change globally, but also South Africa's geopolitical ties. However, there were core elements outlined governing the definition of the JET according to the Postgraduate students which emphasise the prioritisation of the poorer communities and the communities who are directly affiliated with the coal industry.

The transition needs to be strategized such that these groups are not left behind but are rather empowered to fully adapt to the changes without major negative impacts on the individual's lifestyle. The findings also emphasise that one solution cannot be applied across South Africa, hence there is a dire need to understand the individual societies in which these energy reforms would be deployed to avoid resistance.

6.3 Research Question 2 Conclusions

The second research question inquired about the most important factors that needed to be considered during a transition. The findings revealed three factors namely: The rate of unemployment in South Africa, Poor governance and Affordability of electricity.

The transition will bring about changes to the country including the redundancy of many jobs within the fossil fuel space, particularly coal, but also jobs that indirectly depend on these sources of energy. There needs to be a clear strategy for reskilling and upskilling so that those employed in these sectors are not left jobless. Further, there is scepticism regarding the number of new jobs that would be created after a transition which requires to be properly articulated.

The current rate of unemployment continues to increase the level of poverty and the inequality gap in the country which makes access to basic needs a struggle for the lower income households. Findings highlighted that the transition would need to consider the cost of electricity to the poorer households since the deployment of renewable energy infrastructure is high.

The findings revealed a lack of faith in the governing structures which makes people reluctant to buy into the changes intended to be made. Factors like corruption, mismanagement of funds and absence of follow-through on policies demotivate the members of society and need to be sorted out prior to deploying such a huge undertaking.

6.4 Research Question 3 Conclusions

The third research question aimed to uncover what strategies could be implemented to ensure the inclusivity of society in the JET through the eyes of Postgraduate students. The findings indicated the importance of raising awareness and educating communities on energy matters and the energy transition at large. Additionally, rigorous stakeholder engagement should be carried out to ensure society's pain points are considered across various communities.

The JET is a resource-intensive undertaking and requires the right financial capability that the findings stated South Africa currently does not possess. Hence, there should be a stabilisation of the economy first whereby the energy mix is not severely altered to introduce renewables but rather should be phased in bit-bybit as measures are taken to first grow the economy and engage with communities

regarding the transition. The country's core resource – coal should be kept in the energy mix as it is abundantly present. To counter the emissions, coal cleaning technology should be invested instead of discarding the energy source as a whole.

The government has a major role to play in this with good governance being another one of the identified strategies. There should be implementation of policies that benefit its people beyond abiding by multinational agreements.

6.5 Recommendations

This section suggests recommendations derived from the research based on the significance of the study. The study sets out to explore the perspectives of Postgraduate students towards the JET. Therefore, the recommendations are:

a) The government

The study uncovered a deep lack of faith in the governing structures of the country due to continuous disappointments in the form of corruption, mismanagement of funds and an absence of answers to society's cries. The recommendation, therefore, would be for the government to rebuild trust by actioning some of the policies that have been set out.

Additionally, South Africa needs to maintain its utilisation of coal as its primary source of energy since it is abundantly present in the country. Rather, the government should invest in coal-cleaning technologies that would aid in reducing the carbon emissions from its generation. This way, the country will still be on track to meet its global obligations in mitigating climate change.

There must also be increased investment in other fossil fuels such as oil, natural gas and nuclear so that South Africa can capitalise on all of its resources and drive development and economic stabilisation. However, these energy sources should be used in a cleaner manner such as utilising carbon capture during their processing to minimise carbon emissions.

Strict measures should be implemented to ensure the localisation of the industries required in implementing an energy transition such as the industries responsible for manufacturing solar panels and turbines. This will aid in the creation of job opportunities in the country.

Lastly, the government should introduce energy as a subject in primary schools so that children understand its implications on our day-to-day lives and are able to use it efficiently as well as make the right decisions regarding it. Campaigns should also be run countrywide in order to inform people about the energy changes that will be occurring over the next few decades

b) Members of society

Quite a number of Postgraduate students were unaware of the concept of the Just Energy Transition, hence the recommendation is that individuals should take it upon themselves to familiarise and educate themselves about energy matters and the benefits of an energy transition.

6.6 Suggestions for Further Research

The study was limited to Postgraduate Students at the Wits Business School to understand their perspectives towards the Just Energy Transition. The study uncovered the understanding, and established factors that are deemed most important as well as strategies to ensure society is included during the transition. However, there may be varying insights based on geographical locations such as different provinces, as well as financial realities. Therefore, the suggested path would be isolated inputs from various provinces to uncover what the Just Energy Transition means for them and what strategies would be best suited in those provinces.

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ANNEXURE A - PARTICIPANT INFORMATION SHEET

Dear Sir/Madam,

My name is Maria-Salome Gaudence Milanzi. I am a Masters of Management in Energy Leadership candidate at the University of the Witwatersrand in Parktown, Johannesburg. For my Masters, I shall complete a research project as required by my studies. Under the supervision of Dr. Tsele Moloi, I am conducting a research on The Societal Perspective of Postgraduate students at the Wits Business School towards the Just Energy Transition in South Africa. The aim of this study is to explore the perspective towards the Just Energy Transition and understand the implications.

I would like to invite you to participate in an interview as part of my research project. The questionnaire will consist of 9 questions.

If you engage in this survey, no personal expenses would be incurred. Additionally, there are no compensations or reward benefits attached to this interview. If it does not please you to engage, there are no consequences, and you have the option to withdraw or not respond. The interview will be entirely confidential, and no personal information such as your name or address will be required. Any information you provide to me will be kept private and will not be shared with someone else. In my final report, I will use a false identity to reflect your involvement.

Please feel free to email me at any time before or after the interview if you have any concerns. My contact information is listed below. On the university library's website, this study will be published as a research paper. If you would like a summary of the paper, please let me know and I will gladly give it to you. The information gathered for this study will be saved in my Google Drive for a period of two years. For any concerns relating to the ethical procedures of this study, kindly contact the Human Research Ethics Committee (Non-Medical), telephone +27(0) 11 717 1408, email hrecmedical.researchoffice@wits.ac.za

Yours sincerely,

Maria Salome Milanzi.

Researcher: Maria-Salome Milanzi, 2518236@students.wits.ac.za, 0791411170

Supervisor: Dr. Tsele Moloi, tsele.moloi@wits.ac.za, 0736713971

B. PARTICIPANT AGREEMENT FORM

ANNEXURE B - CONSENT LETTER

Title of project: The Societal Perspective of Postgraduate students at the Wits Business School towards the Just Energy Transition in South Africa

Name of researcher: Maria-Salome Gaudence Milanzi

I, ……..., agree to participate in this research project. The research has been explained to me and I understand what my participation will involve. I agree to the following:

(Please circle the relevant options below).

I agree that my participation will remain anonymous	YES NO
I agree that the researcher may use anonymous quotes in his / her research report	YES NO
I agree that the interview may be audio recorded	YES NO
I agree that the information I provide may be used anonymously after this project has ended, for academic purposes by other researchers, subject to their own ethics clearance being obtained.	YES NO

…… (signature)

…… (name of participant)

…… (date)

…… (signature)

Maria-Salome Gaudence Milanzi (name of person seeking consent)

ANNEXURE C - INTERVIEW QUESTIONS

1. To explore Postgraduate students' societal perspective and understanding of the Just Energy Transition.
    - What are some of the issues posed by SAs energy crisis currently?
    - How do you see SA in 2050 with regards to their energy situation? (to identify their vision for SA)
    - Do you think a transition is necessary? Why?
    - Can you explain in your own words what you understand by the JET
2. To explore important social factors that should be considered during the transition What are the biggest challenges facing society currently?
    - What are the key factors to be focused on during a transition to ensure that it is fair?
    - Do you think a transition would help solve these problems or exacerbate them?
    - Can you explain which opportunities you would like to see from the implementation of an energy transition.
3. To identify strategies that can be implemented to ensure inclusivity of the social factors during the transition
    - What can society do to ensure the successful implementation of the JET (society's role)
    - What factors could cause the transition to fail?

ANNEXURE D – ETHICS CLEARANCE

Graduate School of Business Administration
University of the Witwatersrand, Johannesburg

Wits Business School

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

Ethics Clearance Certificate

Ethics protocol number: WBS/EL2518236/353
This certificate is only valid with a legitimate ethics protocol number and signed by the Researcher (below)
This certificate is only valid if permission has been granted by the Registrar's Office of Wits University.

Project title	Wits Business School students' perspectives of the just energy transition
Investigator / Researcher	Ms Maria-Salome Milanzi
Nature of Project	MM (Energy Leadership)
Decision of the Committee	Approved, provided stakeholders and participants are guaranteed confidentialty.
Issue Date of Certificate	2023/10/30
Expiry date	Date of submission of the project / research report
Chairperson	Dr Pius Oba ☎ +27 11 717 3976 +27 82 733 6587 pius.oba@wits.ac.za

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Declaration by Researcher

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

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

Signature

11/11/2023
Date: