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Implications of the just energy transition for employees in the South African coal mining sector

Zukiswa Njokwana

A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Management in Energy Leadership

Johannesburg, 2024

ABSTRACT

South Africa's economy is heavily reliant on coal-fired power which greatly contributes to greenhouse gas emissions, hence the country's commitment to shift to renewable energy by 2030 as per the Paris agreement. However, this shift has the potential to leave employees in the coal mining sector uncertain of their jobs, thus, the need to implement the Just Energy Transition (JET) which aims to institute a just and fair transition for coal mining sector employees and affected communities. This research explored implications of the JET for employees in the South African mining energy sector in Mpumalanga province. It assessed employment benefits and challenges of the JET, and also examined forms of organisational employee support for employees in the coal mining sector in South Africa.

Ten participants were interviewed and the collected data was analysed using thematic analysis. The data incorporated evidence from participants which revealed that there are employment benefits and challenges of the JET for employees in the coal mining sector in South Africa. The data further exhibited that coal mining sector organisations can play a role in supporting employees in the transition process. In conclusion, the study contributed in revealing the JET implications on the South African coal mining sector employees related to employment benefits and challenges, and organisational support mechanisms. Another revelation is that there is a lack of strong awareness about the JET among employees which implies inadequate organisational communication to employees about the JET. This is a threat to the implementation of a just transition for employees.

KEYWORDS

i. Just Energy Transition
ii. Just Transition
iii. Employees
iv. South African coal mining sector
v. Energy mix
vi. Exploring JET employee implications
vii. Renewable energy
viii. Renewable Energy Independent Power Producer Procurement Programme

DECLARATION

I, Zukiswa Njokwana, declare that this research report is my 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: Zukiswa Njokwana Signature: 

Signed at …Midrand…

On the …14… day of …February…2024..

DEDICATION

I dedicate this research to my family, thank you for your unwavering support.

ACKNOWLEDGEMENTS

To my husband, thank you for encouraging me to self-develop.

To my kids, you have been supportive in a special way, much appreciated.

To my supervisor, thank you for being continuously ready to assist.

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LIST OF ACRONYMS

1. CO_2 - Carbon Dioxide
2. COP 21 - 21st Conference of the Parties
3. DBSA - Development Bank of Southern Africa
4. DFFE - Department of Forestry, Fisheries and the Environment
5. DTIC - Department of Trade, Industry and Competition
6. ESG - Environment, Social and Government
7. GHG - Greenhouse Gas
8. IDC - Industrial Development Corporation
9. IFIs - International Finance Institutions
10. IPCC - Intergovernmental Panel on Climate Change
11. IPPs - Independent Power Producers
12. JET – Just energy transition
13. NDC - Nationally Determined Contribution
14. PCC - Presidential Climate Commission
15. PV – Photovoltaic
16. REIPPPP -Renewable Energy Independent Power Producer Procurement Programme
17. RES - Renewable Energy Sector
18. SA – South Africa
19. SOEs - State-owned enterprises
20. UN - United Nations
21. UNFCCC - United Nations Framework Convention on Climate Change

CHAPTER 1. INTRODUCTION

1.1 Purpose of the study

This qualitative study explored the implications of the Just Energy Transition (JET) for employees in the coal mining sector as experienced by employees in South Africa's Mpumalanga province. These employee types are Senior Managers, Engineers, Administration workers, General workers, and Union representative.

1.2 Context of the study

The Intergovernmental Panel on Climate Change (IPCC) registered that climate change is altering the magnitude and severity of extreme weather events (Sorcar, Yoriya, Lee, Grimes, & Feng, 2020). Extreme weather incidents such as severe droughts, tropical storms, wildfires, rise in sea level, and heat waves occur (Osmanski, 2020). These have catastrophic effects on crop production, disrupt animal's natural habitats, and impact human health through infectious diseases, respiratory disorders, and heat-related mortality (Rocque, Beaudoin, Ndjaboue, Cameron, Poirier-Bergeron, Poulin-Rheault, Fallon, Tricco, & Witteman, 2021). Projections based on records and current trends suggest that warmer and drier conditions will worsen in some parts of the world (Halofsky, Peterson, & Harvey, 2020).

At COP 21 in Paris, participants of the United Nations Framework Convention on Climate Change (UNFCCC) agreed to reduce climate change and its effects on the environment. The Paris Agreement aims to encourage global commitment to the reduction of global warming to below 2 ^{0}C (UNFCCC, 2015). The agreement also seeks to assist developing countries in managing the effects of climate change and to monitor progress on Nationally Determined Contribution (NDC) (UNFCCC, 2015).

Burger (2022) implies that South Africa has committed itself to shift to renewable energy by 2030 as per the Paris Agreement. As the country's economy is heavily reliant on coal-fired power, it highly contributes to the GHG emissions (Burger, 2022). Hence, the country needs to transition to renewable energy. Investing in renewable energy is less expensive and more practical to reduce GHG emissions and consequently address the energy crisis in the country (Burger, 2022). However, It is anticipated that South Africa will experience job losses of about 300,000 and create 815,000 new jobs by the year 2050 through the transition to renewable energy. Hence, the South African government needs to engage and implement the JET (Burger, 2022).

The phrase "Just Energy Transition" refers to the principles and policies employed to mitigate negative socioeconomic consequences which are a result of the transition to a low-carbon society (Banerjee & Schuitema, 2022). The term was created by the US labour movement which was reacting to the closure of the chemical industry due to tightening environmental regulations. The emphasis was that the closure should not affect workers and their communities (Banerjee & Schuitema, 2022). However, the phrase "Just energy transition" is employed in a perspective of climate change, energy resources, and conservational preservation to prevent, mitigate and minimise social injustice originating from the JET (Banerjee & Schuitema, 2022). The JET for workers and communities gained momentum and international support during the 16th United Nations Climate Change Conference (COP) held in Cancun (2010), the Paris Agreement (2015), the UN Solidarity and Just energy transition Silesia Declaration (2018), the JET Declaration of COP 26 of 2021, and the Just energy transition Fund established for vulnerable communities which are dependent on fossil fuels industries (Banerjee & Schuitema, 2022).

In South Africa, the phrase "Just Energy Transition" was initially used in 2011 when the government published its National Climate Change Response White Paper (Connolly, 2022). The paper was to demonstrate a vision for South Africa's response to climate change and a sustainable JET to a lower-carbon economy. The phrase "Just Energy Transition" was then frequently used in various policy

documents by government agencies and sectors (Connolly, 2022). However, there was lacking a government organisation to manage the JET work, therefore the efforts were uncoordinated (Connolly, 2022). This led to the government's decision to appoint an independent statutory body in September 2020 to manage and head the government's JET work and determine how maximisation of job opportunities could be achieved. Such an independent statutory body is now called the Presidential Climate Commission (PCC) (Connolly, 2022).

However, the JET requires commitment at local and national levels. Countries are at different economic levels; hence, they seek different solutions to reduce CO_2 emissions and decide on their energy mix (IRENA, 2021). IRENA (2021) further advises that an aggressive energy efficiency strategy of shifting to renewable energy and halving CO_2 emissions by 2030 is a complex process, particularly for countries that heavily rely on coal. Hence, the obligations of the JET for workers and communities have to be considered (IRENA, 2021). A global policy framework and financial investments are required to support socio-economic needs including transition-related jobs. Hence, a thorough analysis of costs, capacities, and employment opportunities is required to form the basis of and accelerate the progress toward the JET (IRENA, 2021).

1.3 Research problem

Implementation of the JET in the South African coal mining sector is plagued with uncertainties about employee job security. Employees in this sector are uncertain of whether they will lose jobs or get new jobs in the renewable energy sector. Molelekwa (2023a) states that employees in the coal mining sector fear that their qualifications may not be sufficient to secure their jobs in the renewable energy sector. Some employees who are furthering their studies in the coal mining sector are concerned about the value of such qualifications. These employees further state that the current education system in South Africa does not equip learners

with the skills required in the renewable energy sector, making it more difficult to get employment (Molelekwa, 2023a).

Employees in the coal mining sector also protest about the government's lack of transparency concerning the transition to renewable energy. The government's lack of consultation with the employees to address their concerns further contributes to their anxieties (Molelekwa, 2023b). Molelekwa (2023a) further states that they do not understand the concept of reskilling, who to be reskilled and when. They are unaware of the training facilities to be set up at decommissioned power stations, how training is to be offered, and who qualifies for such training (Molelekwa, 2023b). Montmasson-Clair (2021) states that some coal mining sector employees will get employment preference over others in the renewable energy sector due to their qualifications, skills, and experience (Montmasson-Clair, 2021).

Other employees are concerned about being transferred to other power stations where their skills are required while decommissioning some power stations (Molelekwa, 2023b). They are also anxious about their houses whether they should sell them, whether will they afford to buy a new house, and what about the entire family- do they also relocate (Molelekwa, 2023b)? This confirms that employment uncertainty in the South African coal mining sector is intimidating to employees in the sector.

This study research addresses the problem of the uncertainties around employee job security which is experienced by the South African coal mining sector employees due to the implementation of the JET. These uncertainties are not well understood and well researched. Therefore, this research analyses implications JET on employees in the South African coal mining sector.

1.3.1 Benefits of addressing the problem

According to the preliminary research conducted by the researcher, this study has not been done. Hence, this study needed to be performed to explore uncertainties, fears, anxiety, job insecurity, and the state of well-being of

employees in the South African coal mining sector. Hassan and Wright (2014) state that the benefits of addressing job insecurity among employees provide a safe organisational climate in which employees feel comfortable discussing issues and concerns without fear of retaliation. This is achieved when there is no job threat and a lack of trust between employees and management (Hassan and Wright, 2014).

1.3.2 Risks of not addressing the problem

Employees who remain in employment where they are insecure about their future poorly perform their functions leading to hostility and intolerance prevailing in their relationships with their managers (Alatawi, 2017). Ndevu (2019) states that a lack of trust between employees and management will directly or indirectly affect individual and group performance. This may manifest itself through employee withdrawal, lack of motivation, ill-discipline and sabotage such as ignorance of duties resulting in poor service delivery (Ndevu, 2019). This surely impacts how coal-operated power stations are run, and consequently how electricity generation and delivery are performed, thereby plunging the whole country into darkness which negatively affects the country's economy (Ndevu, 2019).

Hassan and Wright (2014) further emphasise that threats of not addressing job insecurity will develop employee dissatisfaction and increase the rate of absenteeism which delays significant projects, interrupts colleagues in their designated work and reduces the quality of customer care. This has the potential to negatively affect the organisational image and subsequently its revenues (Hassan & Wright, 2014).

Another risk of not addressing the problem could result in possible job losses in the coal mining sector. This consequently gives rise to poverty, industrial action, and high levels of crime (Bhorat, Lileinstein, Monnakgotla, Thornton, & Vav Der Zee, 2017). Bhorat et al. (2017) further emphasise that high levels of unemployment increase the prospects of seeking illegal income, thereby increasing crime levels, particularly among the unemployed.

1.4 Research objectives

I. To evaluate the employment benefits of the JET for employees in the coal mining sector in South Africa.
II. To explore employment challenges from the JET faced by employees in the coal mining sector in South Africa.
III. To examine forms of organisational employee support in the JET for employees in the coal mining sector in South Africa.

1.5 Significance of the study

a. The empirical significance of the study

As the JET takes shape in South Africa, the decommissioning of coal-fired power stations draws nearer. Employment in the energy sector, particularly the coal mining sector is prone to transformations in markets globally and locally (Montmasson-Clair, 2021). Decommissioning of coal-based Eskom power generation by 2022, further decommissioning of 11 000MW by 2030, and 35 000MW by 2050 have an undesirable impact on employees in the coal mining sector as they face unemployment possibilities (Montmasson-Clair, 2021). Figure 1.1 shows the generation capacity and when some power generations will be decommissioned.

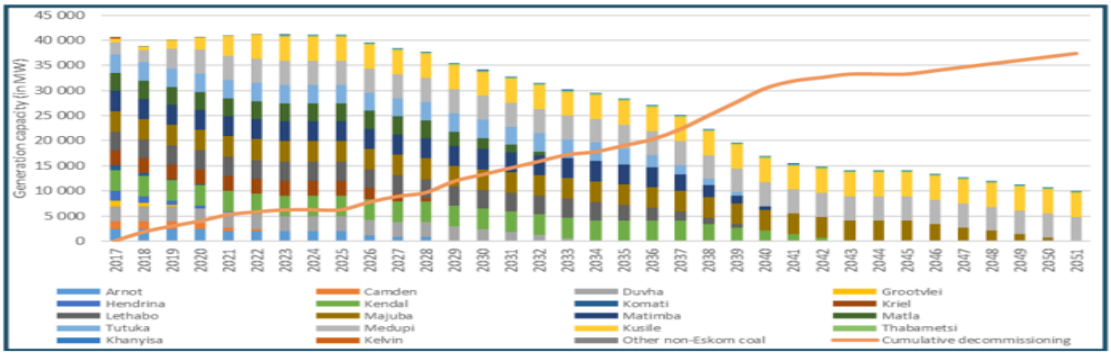


Figure 1.1: South Africa's coal-based generation capacity and scheduled decommissioning (DMRE, Intergrated Resource Plan, 2024)

South Africa's exceptionally high GHG emission is a disadvantage for the country. Trading partners are reluctant to conduct business with carbon-intensive countries or buy carbon-intensive products. Also, border carbon taxes are to the detriment of the country. As a result, many employees may face unemployment as South Africa ventures into renewable energy (Montmasson-Clair, 2021).

b. The theoretical or conceptual significance of the study

The "Just Transition" was established by North American trade unions to look after employees who faced unemployment owing to Just Energy transition guidelines and policies (PWC, 2021). It has become an international framework employed to transition away from fossil fuels while minimising social injustice for employees in the sector. The South African government has adopted this framework to set goals for itself to reduce reliance on carbon-intense energy supplies and non-renewable natural sources to meet its commitment to the Paris Agreement (PWC, 2021). However, this commitment should be balanced with socio-economic development objectives of job creation and elimination of poverty and social imbalance. Hence, the government views the JET as an opportunity to create jobs rather than the opposite (PWC, 2021).

South Africa is among the highest GHG emitters globally and the top country in Africa. South Africa's economy is heavily reliant on coal for its energy products (PWC, 2021). Hence, many South African communities rely on coal-related economies for their incomes. Over 113 000 employees are in the coal mining sector, thus the largest employer in the local mining sector. Therefore, decommissioning coal mines will put a high number of jobs at risk (PWC, 2021). To combat this possible narrative, the South African government has a plan in place to look after employees in the coal mining sector when non-viable coal power plants have reached their end of life. These plans include interventions where such employees will undergo retraining and job relocation, governmental provision of socio-economic needs, supplying monetary support to renewable

energy sectors, and diversifying local economies to become less reliant on coal (PWC, 2021).

c. The practical significance of the study

The energy sector employed over 65 million people in 2019, which is 2% of global employment, 50% of which are employed in clean energy. Up to date, 32 million workers are employed in fossil fuels globally (IEA, 2022). Workers in coal and other fossil fuels have some of the skills required in the clean energy sector. Hence, some companies reskill and reassign their employees to renewable clean energy to retain talent. However, not every business can achieve this, thus the need to explore employment benefits of just energy transition in the South African energy sector (IEA, 2022).

However, the measure of significance of the job market transitions depends on individual country's economic structure, industrial sectors, skills availability and policy choices (IRENA, 2022). Countries tend to have distinctive economic and labour market structures which affect individual countries and region differently. Hence, the need to implement well-planned structural changes. (IRENA, 2022). With appropriate long-term planning, many dislocated workers can readily find work in related sectors, minimising near-term effects from dislocations (IEA, The importance of focusing on jobs and fairness in clean energy transitions, 2021). While a Just energy transition creates opportunities to diversify the economy, it will also have significant impacts on the labor market (Engineeringnews, 2022).

Africa employed about 3 million people in the formal energy sector in 2019. Most of these employees were employed in traditional energy, hence, the figure excludes informal jobs in the same sector (IRENA, 2022a). Employment in renewable energy is minimal to about one percent of the global solar PV and wind power capacities (IRENA, 2022a). This could alter through a JET which is open to both centralised and decentralised renewable energy permitting additional jobs in the energy sector (IRENA and AfDB, 2022).

Additional jobs can be obtained through provision of employee training and reskilling to ensure that the right skills are obtained for manufacturing, installing, and maintaining renewable energy technology. Hence, employer investment in workers skills development is applaudable. (IRENA, 2022). This improves economic revenues through skilful labour force and decreases joblessness while building up productivity and improves the country's economy (IEA, 2022). Job creation in the JET is largely focused on medium-skill professions. Of the twenty five million jobs that could be created through the JET by 2030, sixteen million are medium-skill jobs. This builds opportunities for more middle-class jobs (IRENA, 2022).

The energy sector already faces challenges in hiring qualified talent to keep up with the just energy transition in a bid to accelerate the shift to renewable energy. Skills appraisals should be conducted to quantify the skills level of the energy sector employees (IRENA, 2022). This will guide on which skills to be further developed for renewable energy sector. Policy frameworks should be in place to guide the JET implementation to enable economic and labour market restructuring to achieve maximum employment and income opportunities while reducing social and economic imbalance (IRENA, 2022)

d. Each stakeholder type who could benefit from your study and how they may benefit.

This study could benefit the following stakeholders:

- The South African fossil fuel workers, particularly workers in the coal mining sector who will be significantly affected by the JET. The shift in the energy sector has a potential to create additional jobs, transform jobs, substitute existing jobs, and relocate jobs (Ram et al., 2020). Energy workers in the fossil fuel sector will have an opportunity to be trained and upskilled for renewable energy, and hence be employable in renewable energy sector (PCC, 2022).

- The South African population in general will benefit from the JET as greenhouse emission will be reduced, thereby limiting greenhouse emissions induced premature deaths (PCC, 2022). Electricity blackouts may be eliminated thereby providing energy security to every South African. This will prevent interruption of basic services, particularly for ordinary South Africans (PCC, 2022).
- The South African government will benefit as load shedding will come to an end through a massive rollout of new, sustainable energy sources. This will provide energy security thus increasing economic growth (PCC, 2022). Economic growth will boost job creation and reduce the number of South Africans who are dependent on government hand-outs (PCC, 2022).

1.6 Delimitations of the study

This research had delimitations which indicate what was included and excluded from the study.

1. The study was conducted within the South African coal mining sector in Mpumalanga Province. The targeted mines were Anglo American Kriel and Belfast Exxaro mines.
2. The research sought to explore employee benefits and challenges brought by the JET on employees in the South African coal mining sector.
3. The research does not attempt to resolve employee challenges from the JET implementation in the South African coal mining sector.
4. The research does not include a study on indirect and induced jobs which are generated by the South African coal mining sector, hence, the study only includes employees in the coal mining sector.

1.7 Definition of terms

- **Employment benefits**: are employee compensation packages which consist of extra benefits such as medical aids, retirement funds, and paid

leave, among others. Employers offer these to employees as an employee talent attraction and retainment strategy (Haan & Bottorff, 2023). Some benefits are offered by employees as per the government's requirements. These benefits differ for every business, whether they are financial or non-financial. They serve the purpose of motivating employees towards plausible performance (Mura, Gontkovicova, & Spisakova, 2019).

- **Just energy transition**: is a process of gradual movement towards lower carbon technologies in the energy sector (JET-IP, 2022). Its focus is to reduce the undesirable impact of this gradual movement on workers and communities with stakes in carbon-intense sectors (Zinecker, Gass, Gerasimchuk, Jain, Moerenhout, Oharenko, Suharsono, & Beaton, 2023). It also aims to ensure that the costs and benefits of the transition are equally shared (Hägele, Iacobuţă, & Tops, 2022).

- **Organisational employee support**: it is a supportive work environment afforded to employees in an organisation for which they work, and it is modifiable at the management's discretion. It entails both tangible support such as working tools and intangible support such as socio-emotional support known as motivating and encouraging work environment (Sharif, Bolt, Ahadzadeh, Turner, & Niacorresponding, 2021). Employees tend to react in the same way they are treated by their employers, hence, employers have to maintain a positive work environment at all times (Guan & Frenkel, 2020). Therefore, employees will give their best effort to organisations which is perceived to care about employees' well-being (Morales-Sánchez & Pasamar, 2019).

- **South African coal mining sector**: South African coal mining sector includes all coal mines operating in the country which are mainly based in Limpopo, Free State, Mpumalanga, and Gauteng (Minerals Council of South Africa, 2023). It is the second biggest sector after gold and greatly contributes to South Africa's mineral sales and GDP (Mbendi, 2018). It is vital for South Africa's energy mix contributing about 70% of South Africa's

energy consumption, 75% of the country's electricity generation, and 30% of petroleum liquid fuels. Coal also contributes towards the production of steel, cement, and ferroalloys (DMRE, 2023).

1.8 Assumptions

I. Participants will willingly cooperate during interview sessions.
II. Technical glitches could be quickly resolved for video and telephone interviews.
III. Participants will be able to narrate their thoughts effectively when answering the questionnaire.

1.9 Structure of the report

This report follows the pattern outlined below.

Chapter 2: This is the literature review in which the key terms and concepts about the study are elaborated. The key terms for this study are employee reskilling and upskilling, job creation and substitution, renewable energy sector, coal mining sector, employee financial support, job losses and associated risks, and stakeholder management. These key terms are outlined in the conceptual framework to exhibit how they relate to each other. At the end of the literature review propositions are stated as possible answers to the research questions posed in Chapter 1.

Chapter 3: This chapter is a research methodology in which the research approach, data collection methods, sample and sampling methods, data analysis and interpretation, limitations of the study, the research instrument, and ethical considerations are elaborated. At the end of the chapter, the consistency table with research propositions, data collection and data analysis summary is displayed.

Chapter 4: This chapter presents of findings and discussion in which the demographic profile of participants is elaborated. Results pertaining to proposition 1, 2, and 3 are also exhibited where the thematic analysis method was used to analyse the data. Thereafter, discussions and a summary of findings pertaining to propositions 1, 2 and 3 are highlighted. At the end of the chapter, a table of comparison of literature review and findings is inserted.

Chapter 5: This chapter is conclusions and recommendations in which conclusions and recommendations regarding objectives 1, 2, and 3 are elaborated. A consistency table with research questions, conclusions and contributions to knowledge is inserted in this chapter. Thereafter, recommendations and suggestions for further research are highlighted at the end of the chapter.

CHAPTER 2. LITERATURE REVIEW

2.1 Introduction

A literature involves reviewing of literature to compare and contrast findings of previous research on a particular subject (Paul & Criado, 2020). This assists a researcher in obtaining understanding of the research topic at hand and also identify gaps for future research (Paul & Criado, 2020). Finally, a future research agenda can be proposed based on a gap analysis (Paul & Criado, 2020). Therefore, a literature review allows the researcher to provide a comprehensive picture of what is known on a research topic and the direction for future research based on what is known (Paul & Criado, 2020). This chapter includes a conceptual framework to give a graphic view of how concepts are related to each other. Thereafter, a literature review is explored to formulate propositions 1, 2, and 3.

2.2 Conceptual framework

The JET is a process that includes ensuring that workers in the coal mining sector are shielded from the negative effects of South Africa's transition from fossil fuels to renewable energy. Figure 2.1 shows the benefits and challenges associated with the JET as well as the key role players in the JET process. The transition poses risks such as job losses and related social risks in the coal regions of SA. There may be employee benefits relating to the JET such as new job creation and job substitution, reskilling and retraining, and financial support from international financial institutions. However, renewable energy jobs are usually short term construction jobs whereas coal energy jobs tend to be long-term employment. Other challenges relating to JET include poor stakeholder engagement, political risks, and financial barriers to support workers' livelihood. Hence, the need for employee support in the form of financial support and employee reskilling and retraining to enable employees to be marketable in the renewable energy sector.

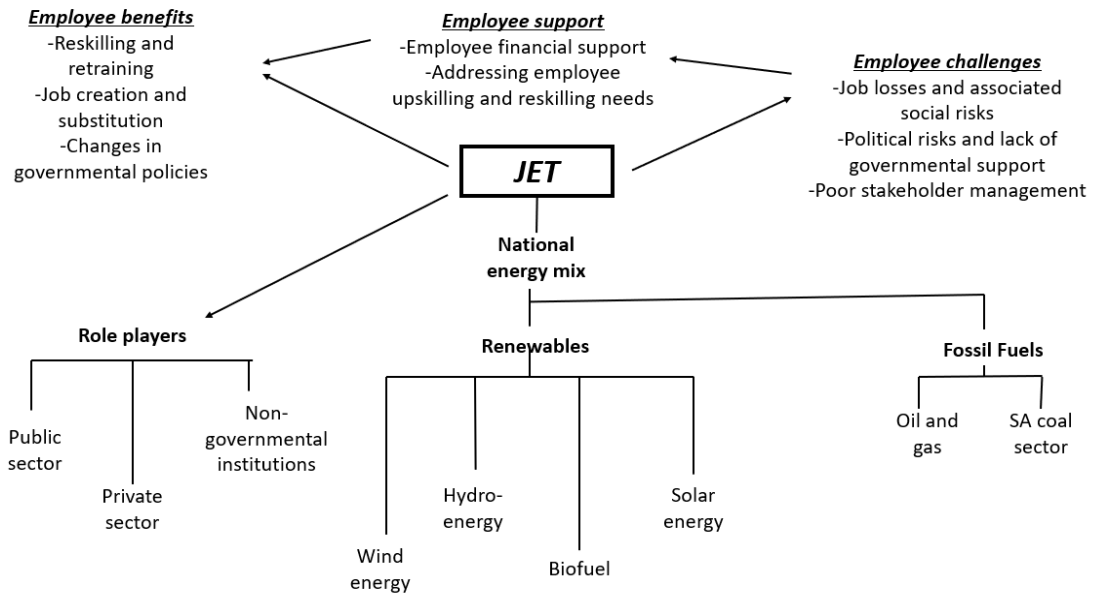


Figure 2.1: Conceptual framework (Source: Researcher)

Other role players in the JET are non-governmental institutes, the public sector, and the private sector. These role players can assist in ensuring a transition that is just particularly for vulnerable groups such as workers and communities in coal mining regions. Renewables and fossil fuels co-exist to form a national energy mix. The aim of the JET is to reduce fossil fuel decency in South Africa and adopt renewable energy.

2.3 Definition of topic or background discussion

The JET Partnership was formed at the COP26 climate summit in 2021. It involves countries such as the United States, Germany, the United Kingdom, the European Union and France (PCC, 2022). Its main aim is to facilitate South Africa's transition to low emissions and decarbonisation of the electricity generation facilities and accelerate the JET (PCC, 2022). In South Africa, the JET is meant for the betterment and improvement of all South Africans' quality of life in the context of climate change and the accomplishment of net-zero GHG emissions by 2050 (PCC, 2022). Hence, the importance of overseeing the

socioeconomic impacts of the JET on vulnerable communities while leveraging on structural transformation. Therefore, social inclusion, jobs, and poverty eradication should be the priority of the JET (JET-IP, 2022). This requires training and reskilling of the marginalised group, women, people living with disabilities, and the youth for future opportunities and economic diversification and innovation (JET-IP, 2022).

Coal demand has decreased globally due to the global drive to reduce GHG emissions to be within 2 degrees Celsius, hence the phasing out of fossil fuels particularly coal. This harms South African workforce as a carbon-intensive country whose power generating capacity is mainly dependent on fossil fuels (Hanto, Krawielicki, Krumm, Moskalenko, Loffler, Hauenstein, & Oei, 2021). Cutting back on fossil fuels will contribute to the existing high unemployment rate of 32.9% and the poor economy in South Africa (STASSA, 2023). In 2022, the coal mining sector employed 90,977 people whose total collective earnings amounted to R31.7 billion (Minerals Council South Africa, 2023). This number of employees has declined from 140 000 jobs in the 1980's (Burton et al., 2019). Hence, the issue of job losses is sensitive both politically and socially. Therefore, energy policies have to be reviewed in light of equity, employment, and social justice, thus the JET (Burton et al., 2019).

JET can be fair only if social justice is upheld for vulnerable groups in society. However, JET will create winners and losers whereby winners are people who will be employable in the renewable energy sector and losers are those groups which will be affected by just energy transition (Banerjee & Schuitema, 2022). For the JET to be effective, all stakeholders have to agree to its interpretation, practical implementation, and targeted outcome to avoid conflict. Hence, stakeholders have to balance their diverse interests, principles, main concerns and intentions (Banerjee & Schuitema, 2022). Banerjee and Schuitema, 2022 further state that JET furthermore aims to avert the unbalanced allocation of benefits and harms across different society groups, hence distributive justice (Banerjee & Schuitema, 2022). Distributive justice translates to compensation of employees and social groups to curb losses and maximise benefits. This can be

done through reskilling, retraining, compensations, job guarantees, community support groups, pension agreements, and employment services (Cha, 2020).

McCauleya and Heffron, 2018 describe the JET as a process which is fair and equitable for transitioning towards a post-carbon society. Fairness must be applicable globally in terms of culture, revenue, and gender in developed and developing countries (McCauley & Heffron, 2018).

2.4 To evaluate employment benefits of the JET for employees in the coal mining sector in South Africa.

JET will have a higher labour demand for direct, indirect, and induced jobs. Direct jobs will be created in manufacturing, transportation, construction, operations and maintenance of renewable energy plants and decommissioning of existing coal energy plants (Hanto, et al., 2021). Indirect jobs will be generated in the supply chain and induced jobs in further services throughout the economy. Some existing jobs will be substituted and redefined due to the transition to renewable energy (Hanto, et al., 2021). This transition can be gradual or sudden depending on the nature and requirements of each job. It also depends on the rate at which technological and market transforms and the rate at which such changes are adopted in the coal industry. Hence, the development of JET policy to govern the transition process for affected workers and communities (Hanto, et al., 2021).

Jobs created in renewable JET provide sufficient incomes and social protection, safe working environments, and value workers' rights (Hanto, et al., 2021). Many health hazards associated with coal mining, such as exacerbated amounts of dust and noise are eliminated in the shift to renewable energy. However, new hazards may be experienced, such as toxic substances used in the production of solar photovoltaic (PV) panels (Hanto, et al., 2021).

2.4.1 Job creation and substitution

Job creation brought about by JET is welcome and anticipated while fear of job losses generates resistance among employees and communities, thereby slowing down the JET process (Sharpe & Martinez-Fernandez, 2021). Also, employment changes and the outcomes thereof are not felt in the same manner across geographies and sectors, with coal-dependent countries mostly impacted negatively by the JET (Sharpe & Martinez-Fernandez, 2021). Regions which highly depend on the coal industry with workers whose skills and capacity are in less demand are vulnerable to new developments in employment policies (Kuriyama & Abe, 2021).

Hence, each country has to map out its own energy mix and employment guidelines which enable sustainable decent jobs and economies (Burger, 2022). Therefore, the timing of the closure of power plants and the new opportunities in the renewable energy industry should be considered to decrease the probability of jobs being lost without any new job opportunities (Burger, 2022). JET has to ruminate the environmental, economic, and social aspects particularly the social aspect as South Africa is one of the countries with the highest rate of unemployment, poverty, and inequality in the world (Burger, 2022).

Transitioning to renewable energy could expand employment by 1.13 per cent per year between 2010 and 2030 (Kuriyama & Abe, 2021). These additional jobs require new skills and competencies, hence, reskilling and upskilling of existing workers is vital to maintain and generate jobs as part of JET (Kuriyama & Abe, 2021). South Africa's transition to renewable energy will add more jobs than will be lost. This transition will contribute the most to changes in and the building of new infrastructure in the renewable energy sector (Kuriyama & Abe, 2021).

Renewable energy in power generation and heat generation have more potential to create jobs and growth, hence higher labour and capital in the wind and solar technologies compared to gas and coal plants (Bulavskaya & Reynès, 2018). Of the 380,000 jobs created in renewable energy in 2012, 23% were by solar PV and 31% by wind energy. Although the most common renewable jobs come from

solar and wind installations, there is a significant number of jobs from maintenance and operation services in the same sector. Export markets for renewables generated 59% of investment-related jobs domestically and 41% with export markets (Bulavskaya & Reynès, 2018). Therefore, more exports should be done for renewable electricity-generating technologies to increase employment in the country. Hence, renewable energy employment is dispersed (Pegels & Lakehurst, 2014).

The South African coal mining sector contributes the most to global warming, hence, it is vital to add renewable energy to its energy mix. However, the high costs of transitioning and reliability are a cause for concern (Moosa, 2023).

Galgócz (2019) argues that renewable energy may not create all jobs in areas where jobs are lost in the coal mining sector, and renewable energy job creation may not happen at the same time and pace as the loss of jobs in the coal mining sector. Galgócz (2019) further denotes that in the next decade, mine closure will be aligned with the decommissioning rate of coal power stations. Direct jobs in the coal mining sector will be lost and renewable energy jobs will emerge to compensate for the job losses but this will happen at a desynchronised rate (Galgócz, 2019).

This desynchronisation and its consequences are most felt by the workers in the coal mining sector (Galgócz, 2019). Workers are left with risks related to re-employment, relocation, job substitution, and managing their exit from the labour force. Hence, transition policies have to be drafted and implemented to manage and balance the transition gap and to minimise dislocation and human suffering (Galgócz, 2019). If properly drafted, these policies can have a meaningful impact on the coal mining sector. Therefore, employment policy development to implement the country’s specific energy mix and improve employee competencies and employability in the renewable energy sector is rather fundamental (Sharpe & Martinez-Fernandez, 2021).

Worrall et al. (2018) state that renewable energy provides higher-quality jobs compared to jobs in the coal mining sector. Wind power plants provide safer and

healthier employment than coal power plants. The JET improves electricity industry performance as chances of blackouts are reduced, hence improving productivity and the country's economy (Worrall et al., 2018).

Louie and Pearce (2016) support this narrative when they denote that solar photovoltaic systems can supply South Africa sustainable and reliable electricity to meet the existing and future demand. Louie and Pearce (2016) further advance their claim to say there is a trend of reduction of solar PV tariffs which results in increased deployment hence creating a large number of jobs. (Louie & Pearce, 2016).

2.4.2 Changes in government policies

Changes in government energy policies to manage and balance South Africa's transition to renewable energy are vital in addressing the challenges faced by employees in the coal mining sector (Sharpe & Martinez-Fernandez, 2021). Policy review is necessary to present the utmost opportunity for jobs and to ensure that the labour force is reskilled and employable in the renewable energy space. Such reviewed energy policies should comprise, among other things, processes and practices that measure the effectiveness of JET in eradicating poverty and unemployment while enhancing environmental sustainability and decent work conditions (Sharpe & Martinez-Fernandez, 2021).

The same policies should promote the employment of women, youth, people with disabilities, and people from specific geographical areas. Hence, the reviewed policy should encompass many policies in different sectors such as development employment policy, industry policy, sectoral level policies, and training and skills development policy. Therefore, policy coherence and coordination are fundamental to achieving successful implementation of policies which endorse jobs in renewable energy space (Sharpe & Martinez-Fernandez, 2021).

South African government plays an important part in promoting the presence of the private sector in the renewable energy economy. This is achieved through monetary support for renewable energy production and employment creation

(Sharpe & Martinez-Fernandez, 2021). Also, promoting and sponsoring the commercialisation and entrepreneurship of renewable energy while enforcing a supportive regulatory system for environmental sustainability can assist in promoting the private sector into the renewable energy economy (Sharpe & Martinez-Fernandez, 2021). Also, the use of public procurement to promote renewable energy goods and services should be endorsed to encourage a renewable energy economy. This in turn will generate more jobs in the renewable energy space (Sharpe & Martinez-Fernandez, 2021).

Pegels and Lütkenhorst (2014) suggest that the Government's intervention to accelerate the restructuring of the economy towards renewable energy is required to obtain environmental sustainability and meet the Paris Agreement, hence the need to restructure energy policies. Energy policies should aim to promote competitiveness and job creation, mitigating climate change, minimising costs to consumers, influencing trade position and long-term technological trajectory and enhance sectoral diversification patterns (Pegels & Lütkenhorst, 2014). They are considered cornerstones of any country's economy as the power of economic development. However, restructuring of energy policies to facilitate the country's transition to renewable energy has its challenges as vested interests may prevent such transition. Hence, energy policies are regularly designed and applied to solve an existing actual ordeal. Long-term planning and a holistic look at political, social, economic and technological challenges must be considered (Pegels & Lütkenhorst, 2014).

Energy policy is one of the requirements in determining a country's future basic infrastructure (Galgócz, 2019). Hence, greater climate ambition translates to greater economic restructuring, more fundamental transformations of production and consumption patterns, and more pronounced and widespread employment impacts. Therefore, the longer the delay to transform energy policies, the more change will have to take place in a short timescale, and thus the relentless impact on employment and the economy (Galgócz, 2019).

2.4.3 Private Enterprise Participation

The Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) was established to diversify energy generation capacity in South Africa (DMRE, 2019). Independent Power Producers (IPPs) were invited in the 2022 bidding window to present their proposals to contribute towards the country's power generation (DMRE, 2019). Such IPPs were to source their funds, equipment, and labour to build power generation plants. However, these IPPs faced some hurdles such as the scarcity of local manufacturing competence and skilled resources (DMRE, 2019). The country has construction capabilities while lacking maintenance capabilities. To mitigate the skills shortage hurdles, IPPs turned to international service providers for resources. This reduces local employment opportunities in the renewable energy sector (DMRE, DTIC, & DSI, 2022).

Currently, South Africa's planned renewable energy power procurement in 2022 was augmented to 5200MW which is almost double the amount procured from bidding window five (Jardim, 2022). Consequently, this increase in demand requires local manufacturing and skills development programmes to be cultivated to respond efficiently to the demand. Currently, South Africa is well-resourced in terms of steel and cement which are critical for the manufacturing of turbines and wind blades (Wentworth & Makokera, 2015). Processing of raw materials, installation of electrical and electronic components, and maintenance of renewable infrastructure are skills which should be further developed to match the renewable energy sector requirements (Wentworth & Makokera, 2015).

Hence, renewable energy policies must be reviewed in light of the current constraints and current resources and labour potential (Jardim, 2022). Reviewed energy policies should enable environmental support for IPPs to work with local service providers and employ locally. Thus, the government's engagement with the private sector should be appraised to achieve a public-private partnership which offers local employment opportunities while providing affordable access to renewable energy infrastructure (Wentworth & Makokera, 2015). This will in turn

generate jobs in the renewable energy sector which is now viewed as the future energy engine in the country (GreenCape, 2022).

The second hurdle faced by IPPs is the need to meet the South African government's requirements relating to broad-based black economic empowerment (BBBEE) goals (Ettmayr & Lloyd, 2017). In bidding window five, the government required that the IPPs source 40% of its manufacturing components locally to boost the local market. This slowed down the IPP development as the local market is not equipped and competent to meet the demand and compete with international counterparts (Ettmayr & Lloyd, 2017). However, the South African government relaxed these restrictions related to BBBEE goals after recognising that such regulations limit the advancement of diversifying energy generation in the country (South African Government, 2022).

2.4.4 Influence of Labour Unions

Over 70% of coal mining sector employees are affiliated with labour unions which fight for their labour rights. These unions ensure labour rights are not trembled upon in a just transition (Hermanus, 2021). Jobs will be lost, replaced and relocated in the move from fossil fuels to renewable energy, while other jobs will be created in renewable energy. Labour unions are a driving force in ensuring that workers are properly consulted and well informed of the just energy transition, opportunities for reskilling and retraining are offered, and workers have decent jobs while financial safety nets are provided (Hermanus, 2021). Currently, workers and communities in the coal mining sector are in the dark in terms of how their concerns relating to just energy transition will be addressed. Hence, the a need for the government’s involvement to ensure thorough consultations are conducted such that no one is left in the dark (Hermanus, 2021).

2.4.5 Financing the JET

Just energy transition financing policies must be a collective effort of the government, the private sector, and development banks. The government must leverage just energy transition funds from the private sector, trade unions, and development banks and disburse such funds among businesses, communities, and civil society organisations (Muhammad & Christi, 2023). The private sector is ready to fund up to R500bn of almost R1.5-trillion just energy transition (JET) investment plan which President Cyril Ramaphosa revealed ahead of the COP27 climate summit which was held in Egypt in 2022 (Joffe, 2022). While blended finance is critical in renewable energy development, public finance is also essential for infrastructure development, particularly for projects which are deemed commercially unviable. However, public funds can be catalysts in attracting private investment through grants together with co-financing by private investors, concessional loans, sovereign guarantees, and political risk guarantees (Muhammad & Christi, 2023).

Transitioning to a low-carbon economic system is difficult, particularly for countries which heavily depend on carbon-intensive industries. Transitioning will be challenging economically, socially, culturally, and politically (Minas, 2022). Therefore, to meet the demands of affected regions, financing should be a bottom-up approach which is aimed at developing the local community's livelihoods through transparent consultation and social dialogue (Minas, 2022). Thus, just energy transition partnership funds which include International Finance Institutions (IFIs) should be spent on enhancing human resource capacity and economic diversification rather than focusing only on financing climate mitigation (Minas, 2022). Most countries like South Africa focus less on addressing socioeconomic impacts on workers and communities. In South Africa, out of the UD$8.5 billion pledged by the IPG, only US$30 Million is channelled for skill development, economic diversification, and social investment. This is only a fraction of the total pledged amount (Minas, 2022).

Lowitt (2021) implies that leveraging International Finance Institutions (IFIs) such as DFI and Green Climate Fund can be done by governments to increase

mobilisation and deployment of just transition funding. International funding should be viewed as an augmentation to local efforts instead of a substitute for national action (Lowitt, 2021). Hence, the South African government should leverage IFIs to impact the technical skills of existing stakeholders in local financial institutions to enhance their financial skills needed for a just transition in South Africa. UK, US, France, Germany and the EU offered to support SA's JET with $8.5bn (R128bn) at COP26 in Glassgow (Joffe, 2022).

Lowitt (2021) indicates that in support of the just energy transition, the private sector should work with the national government, policymakers, regulators and financial authorities to generate a strategic framework which will maximise investments and create opportunities for investors to invest in renewable energy. Therefore, the private sector should take risks at a determined scale with consistent monitoring and evaluation (Lowitt, 2021).

2.4.6 Proposition 1

Employment benefits created by the JET for employees in the coal mining sector in South Africa include job creation and substitution, changes in government policies, private enterprise participation, leveraging on international funding, constant consultation with labour unions.

2.5 To analyse challenges from the JET faced by the employees in the coal mining sector in South Africa.

Disadvantaged groups should be viewed as essential stakeholders, particularly workers and communities affected by the transition to renewable energy (Banerjee & Schuitema, 2022). These workers and communities are mostly susceptible to job losses, job relocation, and transition risks associated with the transition to renewable energy. Hence, to obtain a successful JET, stakeholder

engagement and participation should be promoted (Banerjee & Schuitema, 2022).

It is of utmost importance to be aware of the perceptions and attitudes of affected employees and communities towards the JET and obtain their participation and acceptance (Banerjee & Schuitema, 2022). Lack of employees and communities' acceptance of JET can be a barrier to its achievement as JET and JET processes are highly contested among coal mine workers and affected communities (Banerjee & Schuitema, 2022). These risks have to be addressed to dim South Africa's JET success (JET-IP, 2022).

2.5.1 Job losses and associated social risks

The South African electricity sector greatly contributes to GHG emissions, the ageing fleet of coal power plants is being retired with 22 GW planned to be decommissioned by 2035 (JET-IP, 2022). Due to phasing out coal mines and coal-operated power stations, some jobs may no longer be relevant hence they may be eliminated without direct replacement. The closure of coal power plants will affect plentiful workers in the coal mining sector with dire consequences for vulnerable groups (JET-IP, 2022).

The main challenge for such a group of people is to find alternative employment due to the absence of other industries which can absorb such displaced workers (Banerjee & Schuitema, 2022). The capacity gap between coal mining sector employees and renewable energy sector employees and the absence of retraining and reskilling further contribute to the displacement of workers and physical relocation may be an option. Therefore, such displaced workers will tend to depend on governmental grants and other governmental public support programs which increases pressure on the government. The loss of local jobs may dampen the economy, and usher in poverty, social instability, and political deterioration. All this poses social risks (Banerjee & Schuitema, 2022).

Social risks associated with the transition to renewable energy bud from changes in employment status, such as job loss, job relocation, and job substitution. Job

loss particularly contributes to social imbalance such as poverty, inequality and consequently crime, hence a social safety net is required to build resilience in vulnerable communities (JET-IP, 2022). Todd and McCauley, 2021 suggest that a diverse group of policy barriers relates to socio-cultural issues such as lack of skills, therefore, education, training and community support are essential to achieve solid societal change (Todd & McCauley, 2021). Other social risks associated with the transition to renewable energy are related to the fact that renewable technologies are largely dependent on overseas expertise and specific minerals for design and manufacture. This creates a barrier to societal progress and employee retraining and reskilling. Hence, an enlarged skills gap and unemployability of coal mining sector employees in the renewable energy sector (Todd & McCauley, 2021).

2.5.2 Political risks and lack of governmental support

Governments have the power to allocate resources, decide on a national strategy, and pass governmental laws, regulations and legislation. It is therefore the governmental role to lead the country's JET. It is also their responsibility to ensure the JET is well understood by all stakeholders, particularly the vulnerable groups (Todd & McCauley, 2021). Banerjee and Schuitema (2022) suggest that workers who are employed in the coal mining sector do not see the transition as just, as a result, they harbour negative emotions such as frustration, anxiety, betrayal, and anger against the government. This may be due to different conflicting interpretations of the JET and the approach to its implementation (Banerjee & Schuitema, 2022).

Banerjee and Schuitema (2022) suggest that it has been the government's idea and desire to lessen the undesired impacts of the JET on predisposed groups. However, this has only been an idea which has not materialised. As a result, scepticism and mistrust have developed among employees towards the efficiency of the JET agenda and the actual political motives which drive the execution of the JET are questionable (Banerjee & Schuitema, 2022). This mistrust and scepticism towards the JET programme may pose a challenge to

the creation and promotion of renewable energy jobs. Hence, stalling, delaying or even blocking the transition due to local resistance. This can result in failed JET (Banerjee & Schuitema, 2022).

A need exists for coherent planning of the JET at the macroeconomic level to improve basic employment policies and workers' rights (Gambhir, Ferus, & Peter, 2018). Therefore, a support policy is required to improve data collection processes on the scale and scope of existing jobs in the coal mining sector and the scale of future jobs in renewable energy. Industrial policies are particularly at risk for countries with poor institutional capacity, poor civil society, and low transparency or governmental accountability in organisations (Gambhir, Ferus, & Peter, 2018). They are rather more effective in high-capacity countries with an educated population and high governmental accountability. Therefore, policymakers should not sideline and view coal mining sector employees and communities as problems to be solved to succeed in JET. Rather, they should give attention to the limitations and barriers to JET based on other country's experiences (Gambhir, Ferus, & Peter, 2018).

Engagement across different levels of government is essential to warrant policy coherence (Worrall et al., 2018). Such platforms provide a strong dialogue between different levels of government, particularly SOEs which play a key role in the planning and implementation of JET policies and provide support and social protection for workers (Worrall et al., 2018). The government should also oversee the implementation of agreed measures and encourage diversification into renewable energy opportunities and technologies. Any platforms for dialogue across all stakeholders must be designed such that vested interests and power dynamics are distinguished. This is to ensure that every stakeholder's voice is heard in the planning and policy-making processes (Worrall et al., 2018).

The JET policies are divided into reactive and proactive policies. These policies are aimed at assisting coal mining sector employees which are impacted by the JET (Gambhir et al., 2018). Reactive policies are meant to enable employee reskilling and upskilling, offer employee income support, institute job relocation and job creation for displaced workers, provide employee pension and transition

support strategies (Gambhir et al., 2018). Proactive policies are meant to maximise long-term benefits of the JET, which include assisting industries to shift to renewable energy, safeguard public spending, avail funds to assist vulnerable groups in the JET, and pursue skills training. Hence, national government should collaborate with local government and all relevant stakeholders to institute and implement both proactive and reactive policies to ensure a fair JET (Gambhir et al., 2018). Shown below in Figure 2.2 is the picture of the Just Energy Transition Stakeholder Map which depicts stakeholders involved and affected by the JET.

2.5.3 Poor stakeholder management

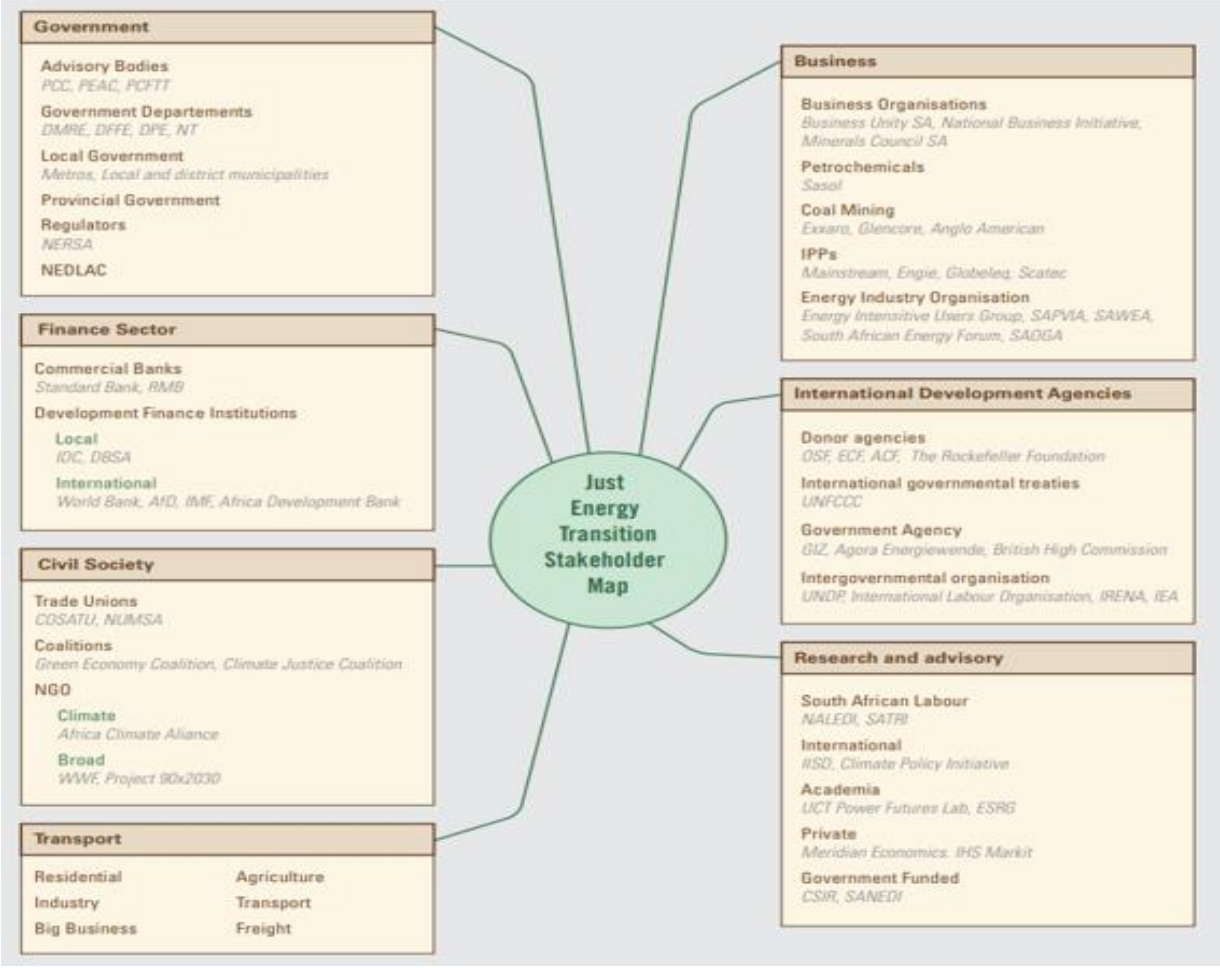


Figure 2.2. South African energy transition stakeholders (Tyler & Mgoduso, 2022)

Connolly (2022) implies that JET should be understood by all affected stakeholders. Stakeholder engagement and management ought to be exercised early on and often and with transparency to ensure people's voices are heard and that the community understands what happening throughout the transition process (Connolly, 2022). Community and stakeholder engagement must be conducted on planning land and infrastructure use related to the closing or decommissioning of coal power plants and repurposing of mines (Connolly, 2022). This ensures equity and collective support for a smooth transition. This guarantees that all interests are represented in final decisions. Failure to engage stakeholders may result in the implementation of JET (Connolly, 2022).

Lack of stakeholder management may lead to unmet expectations and subsequently frustrations (Banerjee & Schuitema, 2022). Therefore, there should be a predetermined process to influence stakeholders' expectations and concerns to warrant a correct understanding of the intentions and goals of the JET. Information campaigns are essential to decrease anxiety suffered by concerned employees and the public. In addition, proper support in terms of funding and emotional support further enables employees to adapt to arising changes (Banerjee & Schuitema, 2022).

Recommended stakeholders for the JET are national and local government, the private sector, labour unions, SOEs, transport, the finance sector, and civil society (Todd & McCauley, 2021). Some stakeholders are more influential than others, such as organised labour or the mining unions which are politically influential and can fight for the rights of their members (Todd & McCauley, 2021). Hence, a coherent social dialogue and close collaboration between these stakeholders warrant procedural justice and buy-in from all relevant stakeholders (Gambhir et al., 2018). These stakeholders pose a role of managing the social implications of JET, creating accountability in the implementation of policies, and being influential in policy-making around job creation, wages, working hours and pensions. Such stakeholders also can influence the provision of renewable energy products and services with cost-effectiveness, social inclusion, access to basic services, livelihood and security, and job creation. These stakeholders may

not pose similar interests and views on the JET but are purposed to work together to create mutually inclusive policies (Worrall et al., 2018).

However, non-governmental stakeholders who are mostly negatively affected by the JET are often marginalised in the JET policymaking. This tempers with workers' rights and voices. This could be because countries seek growth at the expense of employees (Worrall et al., 2018). Nonetheless, in South Africa, labour unions are the driving force behind workers' rights and they jealously guard such rights. Unfortunately, informal workers are often overlooked and excluded from social dialogue due to a lack of union representation (Worrall et al., 2018).

2.5.4 Private sector's lack of involvement

Parker (2023) suggests that there has been insufficient interaction between the South African government and the private sector concerning the economic hardship that the country currently faces. Although the government constantly pleads with the private sector to offer a hand, the government is found unwilling and unable to work with the private sector (Parker, 2023). The government does not trust the private sector in that there are areas of the energy sector which the government wants total control of despite having no capability to manage or operate. Such capacity essentially remains with the private sector. Presently, South Africa is facing load shedding, poor economic growth, a high unemployment rate, and increased inequality. Hence, the need for the private sector's involvement to leverage the current opportunities (Parker, 2023).

Staff-Write (2023) indicates that the government has reached out to the private sector for assistance, however, despite the outreach, the private sector does not have legislative power or other powers to make decisions that plot the country's way forward. Although the government has been promising to work with the private sector, this has not materialised instead the government only drives the private sector to create more jobs without enabling the environment for such (Staff-Writer, 2023).

2.5.3 Financial Barriers

The South African government is averse to embarking on new spending priorities which negatively affects essential service delivery in the country as it anticipates a financial crisis ahead. The country's generated revenue from corporate and personal income tax is not sufficient to finance increasing societal demands. Hence, the National treasury calls to government departments to halt further spending and also announce the implementation of budget cuts in 2024 (Dolley, Fengu, Heywood, & Mahlaka, 2023). Sguazzin (2023) indicates that the initiatives to assist workers and communities in the just energy transition have been donor-funded. No funding has been received from the government to assist workers and communities in seeking alternative income as the provincial and local governments have no allocated budget dedicated to just energy transition initiatives (Sguazzin, 2023). The Mpumalanga province which has 83% of national coal production will lose 48 500 jobs at power plants and mines by 2030 owing to coal power generating stations and mine closures, these communities are left to fend for themselves (Sguazzin, 2023).

Paton (2023) implies that National Treasury is planning to alleviate financial pressure from Eskom in the next three years but with conditions such as: franchising out some of its power stations to the private sector, should employ the government's debt relief only for debt repayment, no remuneration adjustments to be implemented by Eskom which may contribute to its poor financial state, no new generation projects to be funded, and revenue from the sale of non-core assets to contribute towards debt relief (Paton, 2023). Eskom has R422 billion of debt due to its construction of Medupi and Kusile power stations which the company cannot service from its earned revenue. Thus impeding efficient operational capacity, operational cash flow, and borrowing ability to expand the transmission grid (Paton, 2023).

Another financial barrier is the fact that in South Africa, the majority of funding particularly private funding, is for well-established projects which are operating on a commercial level (Lowitt, 2021). This is due to the low-risk profile such projects pose and that they have predictable financial returns (Lowitt, 2021).

Lowitt (2021) further implies that financial institutions also lack competent project managers who are knowledgeable in the renewable energy space, hence they cannot evaluate the profitability of a renewable energy project to be able to grant financial assistance accordingly (Lowitt, 2021).

Domestically, grant funding is difficult to get due to the poor financial state of the South African government (Lowitt & Levin, 2021). Other grant funding can be sourced from national departments such as the Department of Forestry, Fisheries and the Environment (DFFE) and the Department of Trade, Industry and Competition (DTIC) through their budget or through the Industrial Development Corporation (IDC) or Development Bank of Southern Africa (DBSA) which manages funds on behalf of the departments (Lowitt & Levin, 2021). The Development Finance Institutions (DFIs) do not offer grants directly due to the government's inability to underwrite their losses. Hence, the DFIs must operate to make a profit despite their developmental mandate. These blockages collectively amount to structural barriers which prevent the development of new renewable energy businesses and consequently prevent job creation in the renewable energy sector (Lowitt & Levin, 2021).

2.5.6 Proposition 2

Employees in the coal mining sector in South Africa face challenges such as job losses, poor stakeholder management, political risks, financial barriers, the private sector's lack of involvement, and lack of governmental support.

2.6 To examine forms of organisational employee support in the JET for employees in the coal mining sector in South Africa.

Sources of finance, particularly private sources, for ongoing social infrastructure such as healthcare, educational and digital centres may decrease owing to the

transition, therefore it may be necessary to seek other sources of finance. Workers affected by the transition have to be provided with enhanced health, retirement, retrenchment packages, and continuous income support for social security (JET-IP, 2022).

Renewable energy can absorb coal workers who lost their jobs during the JET once such coal workers go through reskilling and retraining to acquire the same skill set as the employees in the renewable energy sector (JET-IP, 2022). Therefore, the establishment of a local skills intelligence is required to identify new employment opportunities, existing skills among employees, skills gaps, upskilling or reskilling needs and opportunities, and retraining in the form of short courses, on-job training, and multi-year degrees, particularly the technical level workers (JET-IP, 2022). Paid study leave ought to be granted to employees who need accessibility to training with consideration of the family needs of both men and women. The South African government should subsidise with funding for such training and upskilling of employees. Also, employees who decide to relocate elsewhere and leave coal employment should be provided with mobility schemes (JET-IP, 2022).

2.6.1 Employee financial support

Employers can provide financial support for employees in terms of wage guarantees, pension funds, healthcare benefits, and early retirement packages to mitigate workers' economic losses in the short term (Gambhir et al., 2018). Together with the government, employers should invest in infrastructure for skills training for affected employees and also launch alternative industries to prevent industrial decline in the medium term. Government, educational institutions, and businesses should invest in renewable energy-related education to support new trades that participate in sustainable development and opulence (Gambhir et al., 2018). Employers in the coal mining sector should be mandated to pay for workers' retraining. Hence, they should reserve a portion of their revenue over several years to warrant the employability of all employees when coal plants are

decommissioned. Governmental financial support should be sought to contribute towards substantial overall training costs (Louie & Pearce, 2016).

The coal mining sector industries should manage workers' perceptions, workers should view their employers as though they have their best interests at heart (Louie & Pearce, 2016). Therefore, giving exorbitant top management benefits is discouraged while countless ordinary workers are losing their jobs. Hence, executives' salaries should be reasonable to gain workers and community support and to ensure workers have a socio-economically stable future. This improves employee morale and improves productivity and thus profit (Louie & Pearce, 2016).

2.6.2 Addressing employee upskilling and reskilling needs

An analysis and understanding of skills required for renewable energy is imperative for adequate defusal through the workforce. This assists in defining the reskilling and retraining requirements of the renewable energy economy. Hence, it is essential to know where and how such skills can be assessed and learned on the job (Sharpe & Martinez-Fernandez, 2021). JET should provide re-training programmes to employees while allowing employees who opt for early retirement to obtain their pension funds. The National Just Energy Transition Fund should also be established with the assistance of the government and the private sector to sustain employees and communities through the JET process. The fund should be used for employee development and training to reduce the effects of the JET (Banerjee & Schuitema, 2022).

Also, a comprehensive social protection system and measures have to be in place to protect workers and communities from the renewable JET shock (Sharpe & Martinez-Fernandez, 2021). Measures such as healthcare support, unemployment insurance fund, and premature retirement for elderly employees who are reaching their retirement years (Sharpe & Martinez-Fernandez, 2021).

For each job in the coal industry, an equivalent job in the renewable energy sector should be determined to quantify retraining time and the required investment

needed for each coal worker (Louie & Pearce, 2016). The amount of training needed should be determined based on the educational requirements, and the employee's pre-existing skills and knowledge. There are two options available for coal employees; for employers to retrain all employees in the coal mining sector to find jobs outside the sector or for employees to self-fund retraining (Louie & Pearce, 2016).

Some coal mining sector workers are close to retirement and would rather choose early retirement with a low monthly income than to be retrained to match their current income (Louie & Pearce, 2016). Young unskilled coal mining sector employees will be severely financially penalised should they decide to follow this path. Coal employees who choose to be retrained during working hours or holidays and weekends are better off than employees who wait to be unemployed before showing a willingness to be retrained. Although retraining costs may be substantial for individuals, they rather overlook that and focus on being competent for the increasing competition in renewable energy jobs (Louie & Pearce, 2016)

2.6.3 Proposition 3

Various forms of organisational employee support for employees in the coal mining sector in South African JET include employee financial support, and addressing employee upskilling and reskilling needs.

2.7 Conclusion of Literature Review

JET can be just if the vulnerable groups' voices are yielded to. Workers in the coal mining sector are vulnerable to job losses during the transition from coal to renewable energy. Therefore, the onus rests upon the South African government to ensure that communities and workers who are dependent on the coal mining sector for a living are catered for in the transition. Hence, the government needs to engage all stakeholders to ensure their views and concerns are heard and addressed. Lack of stakeholder management may lead to unmet expectations

and subsequently great disappointments. Hence, policies which govern the coal mining sector might have to be revisited and re-adjusted to accommodate everyone during the transition and beyond. Also, the government and employers should invest in infrastructure for skills training for affected employees so they can be absorbed in the renewable energy sector.

2.7.1 Proposition 1

Employment benefits created by the JET for employees in the coal mining sector in South Africa include changes in government policies, private enterprise participation, leveraging on international funding, constant consultation with labour unions, and job creation and substitution.

2.7.2 Proposition 2

Employees in the coal mining sector in South Africa do face challenges such as job losses, poor stakeholder management, political risks, financial barriers, the private sector's lack of involvement, and lack of governmental support.

2.7.3 Proposition 3

Various forms of organisational employee support for employees in the coal mining sector in South African JET include employee financial support, and addressing employee upskilling and reskilling needs.

Table 2.1. Consistency table: research objectives and propositions

RQ #	State Objective	Prop #	State Proposition
1.	To evaluate employment benefits of the JET for employees in the coal mining sector in South Africa.	1	Employment benefits created by the JET for employees in the coal mining sector in South Africa include changes

RQ #	State Objective	Prop #	State Proposition
			in government policies, private enterprise participation, leveraging on international funding, constant consultation with labour unions, and job creation and substitution.
2.	To analyse challenges from the JET faced by the employees in the coal mining sector in South Africa.	2.	Employees in the coal mining sector in South Africa face challenges such as job losses, poor stakeholder management, political risks, financial barriers, the private sector's lack of involvement, and lack of governmental support.
3.	To examine forms of organisational employee support in the JET for employees in the coal mining sector in South Africa.	3.	Various forms of organisational employee support for employees in the coal mining sector in South African JET include employee financial support, and addressing employee upskilling and reskilling needs.

CHAPTER 3. RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes how this study's research methodology was conducted. This includes the research approach, research design, data collection methods, population, data collection procedure, research instruments, and data analysis and interpretation. This chapter also indicates that the research methodology used for this study was based on interpretivism philosophy. At the end of this chapter, a consistency table with research propositions, data collection and data analysis is presented.

Kuhn (1970) describes interpretivism as one of the research paradigms or sets of beliefs shared among researchers about how problems should be solved. Interpretivism emphasises that truth and knowledge are subject to how people translate reality in dissimilar chronicles and cultures using description data for research which is not the same as the research methods of natural science (Junjie & Yingxin, 2022).

3.2 Research approach

The research approach employed in this study is a qualitative research approach which involves interviews that can be conducted either in-person, telephonically, or virtually. Smith (1993) indicates that focus groups may also be used as an alternative to collect qualitative data. Bhandari (2023) describes qualitative research as gathering and examining non-numerical data such as video and audio to appreciate ideas, sentiments and encounters. It can be employed to collect an in-depth comprehension of a problem or create new ideas for research (Bhandari, 2023).

Researchers better understand interviewees when they can see facial expressions and body language (de-Villiers, Farooq, & Molinari, 2021), hence

they prefer in-person interviews. However, video interviews can be cost-saving on travel and accommodation, mostly when the research participants are geographically dispersed (de-Villiers et al., 2021). Telephone interviews are acceptable in cases where interviewees have access to telephones (Rahman, 2015). Digital interviews such as online video or audio also form part of in-person interviews which have the advantage of cost-effectiveness, few limitations of time and space, and are effective for achieving anonymity particularly where sensitive information will be shared. Digital interviews also allow interviewees to withdraw from the interview and decide where the interview will take place (Bakken, 2023). However, digital competence is required for participants in digital interviews (Lobe, Morgan, & Hoffman, 2022).

3.3 Research design

This research employed a phenomenology design applied to the population comprising employees in the South African coal mining sector. Phenomenology design contributed to finding out people's experiences as told by the people themselves (Kagimu, 2019).

3.3.1 Advantages

Phenomenological research provides rich, remarkable, and natural data which is collected directly from interviewees instead of artificial data (Kagimu, 2019). This data collection contributes to adapting new problems as they develop. Phenomenological research focuses on underlying issues and actual experiences of a specific research topic rather than scientific knowledge and underlying theories (Kagimu, 2019).

3.3.2 Disadvantages

Researcher-induced bias can influence the outcome of the research, and interference with the interpretation of data can hurt the outcome thereof

(ConnectUS, 2017). It may also be difficult to control the pace, progress and endpoints in a phenomenological study (Kagimu, 2019).

3.4 Data collection methods

The data collection method used for this research is an in-depth interview with employees in the South African coal mining sector in Mpumalanga province. This approach was chosen to:

- Allow the researcher to pose follow-up questions or seek clarification when participants' responses are ambiguous.
- Provide flexibility in conducting interviews in-person, telephonically, or via online video with participants in the South African coal mining sector.
- Read unsaid information through the body language of participants when in person.
- Foster an environment in which interviews conducted could be directed to improve participants' responses.

Showkat and Huma (2017) suggest that there are three approaches to conducting in-depth interviews which include informal conversational interviews, general interview guide approach, and standardised open-ended interviews. In-depth interviews may also be semi-structured, unstructured or a mix of the two (Showkat & Huma, 2017). In-depth interviews are mostly conducted in person and are known to extract more information and a deeper understanding of a concept. Researchers are usually cognisant of which questions to ask and areas to cover during the interview (Showkat & Huma, 2017).

In-depth interviews are effective in uncovering in-depth details of interviewees' experiences and perspectives on a subject (Showkat & Huma, 2017). Hence, these kinds of intensive interviews are usually conducted with a small number of participants. Interviewers have to create a comfortable environment for interviewees to be able to engage effectively. Hence, the interviewer has to foster a relationship with interviewees and respect their views as individuals to gain their trust and understand their perspectives (Showkat & Huma, 2017).

3.5 Population

Population refers to people, a group of individuals, groups, organisations, social objects, or social interactions pursued for research (Murphy, 2016). Thacker (2019) defines a population as a group of individuals who possess specified similar characteristics as defined by the researcher (Thacker, 2019). Therefore, a population denotes a crowd with the same species, occupying a defined area, sharing similar characteristics, and usually different from other similar groups (Ravikiran, 2023). The population for this research is employees in the South African coal mining sector in Mpumalanga province. The targeted mines are Anglo American Kriel and Belfast Exxaro mines. Pernecky (2016) suggests that researches are normally done for the advantage of the pursued population. Pursued employees include blue-collar employees who work in mine shafts, white-collar employees who do office work, and employees at different managerial levels (Pernecky, 2016).

3.5.1 Sample and sampling method

a. Sampling design

Purposive and snowball sampling was used for this study. Purposive sampling is a method utilised in qualitative research to choose a particular group of individuals or units for investigation. Participants are selected intentionally not randomly. Snowball sampling is where a referral approach is used to reach participants who are hard to find (Pernecky, 2016).

b. Sampling method

Sampling is the process of selecting units, for example, people, from a target population for research, whose research results can then be generalised back to the population from which they were chosen (Du Plooy-Cilliers et al., 2014). The major aim of the sample is to allow researchers to apply research on a group of

individuals from a population, and the results of the study can be used to derive conclusions which apply to the entire population. This research used non-probability sampling techniques. Du Plooy-Cilliers et al. (2014) suggest that non-probability sampling is a sampling technique in which a researcher chooses samples based on his subjective judgment rather than random selection. Table 3.1 shows the profile of participants. The demographic profile of the sample was employees in the coal mine sector in Mpumalanga province in South Africa. The number of interviewees targeted was 15, however the actual sample size was guided by data saturation. Data saturation is a sample size beyond which one can no longer collect fresh information.

Table 3.1. Profile of participants (by position or context not name)

Description of participants type	Number sampled
Senior managers	2
Engineers	3
Administration workers	2
General workers	2
Union representative	1
TOTAL number of participants	10

3.6 The research instruments

Research Instruments are measurement tools used to gather data on a specific topic of interest from target participants. For this study, the research instrument

used was an interview schedule which was scheduled with employees in the South African coal mining sector in Mpumalanga province. See Appendix C for the interview schedule and Appendix A for the Participant Information Sheet.

The interview schedule will be used as the research instrument for this study. The interview schedule offers the advantage of flexibility where the researcher can change the direction of the interview questions to get the participants to reveal more about the subject at hand (Alamri, 2019). This method permits the interviewer to effectively survey the interviewee's thoughts, feelings, and opinions. The interviewer can probe more on unsaid thoughts, feelings, and ideas suggested in the interviewee's responses. This enhances the qualitative data as questions are clarified to increase the accuracy of the collected data (Alamri, 2019). The personal interaction between the interviewer and interviewee assists in developing a relationship between the two which allows the interviewee to develop trust towards the interviewer. This trust allows the interviewee to open up about the subject at hand to the interviewer (Alamri, 2019).

Establishing relationships is vital for a successful qualitative interview. Another advantage of this type of research instrument is that the interview can be recorded to assist in data collection and future data analysis (Alamri, 2019). The interview can start with a set of standardised questions which are asked to all participants, yet as the interview advances new questions may arise which are guided by the gathered information. However, disadvantages of interview schedules include the fact that they are time-consuming. Interview scheduling, recording, and analysing data are time-consuming. Also, scheduling the most convenient time for the interview is vital as this can affect the interview and the participants' answers (Alamri, 2019).

3.7 Procedure for data collection

Data will be gathered using in-depth interviews which will be conducted through face-to-face, video calls, and telephonically. The interview questions were semi-

structured to enable the researcher to obtain quality interviews and explore the interviewee's experience. Memon (2020) states that to communicate effectively with communities where research will be conducted, mutual trust must be fostered to gain support that will sustain the research project. Thereby providing a mutual benefit to both the researcher and the community. Trust can be fostered through early engagement with the community before starting with the research. This will allow them to raise any concerns about the research project (Manohar, MacMillan, Arora, & Steiner-Lim, 2020). Participants' perceptions on the interview topic should be known to understand how to best communicate with them. This includes their expectations and the social and cultural contexts in which they live. Questions should be asked by the researcher instead of making assumptions, and lend an ear instead of preaching (Bercht, 2023).

Transparency is vital when communicating with participants, informing them of what the research is about and how it affects them and mentioning how they will benefit as well. Research consent should be written in a language that participants understand or an oral presentation should be made for illiterate participants, this should be recorded (Staff-Writers, 2022). Communication should continue at the end of the research to give feedback on the research results to the participants, particularly if they are affected (SciDevNet, 2014).

3.8 Data analysis and interpretation

This research employed Thematic Analysis for data analysis. This involves identifying patterns, creating codes, and arranging codes into themes. The type of thematic analysis used is Inductive Thematic Analysis where meaning is derived and themes identified from data with no preconceptions and no expected outcomes. Therefore, collected data was reduced to small statements with meanings to form codes. Codes with common patterns were grouped to form themes.

Lochmiller (2021) suggests that thematic analysis assumes that participants' memories are worthy to be explored. It assumes that recorded information is an indication of the reality that existed at the time and should be handled with confidence as the participants' spoken recollections. Hence, thematic analysis is deemed reliable and trustworthy (Lochmiller, 2021). Therefore, thematic analysis is aimed at considering how reported information addresses a particular research question or invites a new conceptual or theoretical understanding. Thus, thematic analysis relates to the data in a large sense rather than detailed individuals' experience (Lochmiller, 2021)

3.9 Limitations of the study

- Dealing with refusal where participants deem the research as a waste of time and therefore refuse to be interviewed. This was overcome by engaging participants well before the interview date to gain their trust and confidence in the research.
- Conducting interviews can be costly and time-consuming. However, this was compensated by conducting video or telephone interviews.
- Technical glitches for video interviews, which were solved by providing a backup solution such as telephone interviews.
- Misunderstanding of and incorrectly responding to questionnaires by interviewees. This was solved by explaining the questionnaires to interviewees and allowing time for them to decide whether to participate or not to participate.
- Deliberate lying of the participants to keep relevance to socially desirable answers. Engaging with the community at large assisted in sensing and understanding what was socially acceptable and unacceptable, hence structuring the questionnaire accordingly.
- Recording errors which were prevented by getting familiar with the device to be employed in interview sessions.

3.10 Trustworthiness

3.10.1 Transferability

Transferability suggests that findings obtained from one study can be applied to other groups of people and can offer valuable lessons to other similar settings (Daniel, 2019). To demonstrate transferability, the researcher chose participants based on their knowledge of the subject under study. Also, transferability is demonstrated when there is a comparison between participants' characteristics and demographic information available to the group being studied (Daniel, 2019). Hence, a qualitative study is considered transferable when individuals who are not part of the sample studied can relate to the outcome of the study with their own experiences. To achieve transferability, researchers indicated delimitations of the research and the context in which it was undertaken (Daniel, 2019). To maximise transferability, this research indicated the delimitations of the study and the chosen participants were those knowledgeable in the topic at hand.

3.10.2 Credibility

For the study to be credible, findings should be dependable, and relevant, and should correlate to the perspective of those who provided data. Data analysis should be clearly and carefully described and sources of data should be verified with participants from whom data was collected (Daniel, 2019). The researcher should involve the participants in data analysis and send back the outcome of the study to the participants for verification purposes. Credibility can be obtained by providing an independent analysis of data by other researchers. Triangulation, where the obtained data from more than one source is converged, should be implemented to further achieve credibility (Daniel, 2019). To maximise the credibility of this study, an examination of previous research was also implemented to frame findings.

3.10.3 Dependability

The research should provide an in-depth methodological description to allow the study to be repeated in future studies. Hence, the employment of “overlapping methods” should be applied (Chowdhury, 2015). To enhance the dependability of qualitative research, an “inquiry audit” should be used where observers inspect both the process and the product of the research for consistency (Hoepfl, 1997). This research made use of experts from the Wits Business School who took the research process and the research instruments through the Wits Business School approval system and supervision. Their opinions as gatekeepers were positive.

3.10.4 Confirmability

Triangulation can be employed to reduce the effect of investigator bias. In this study flaws in the study’s methods and their potential influence on the study were identified and addressed to promote the research’s conformability (Chowdhury, 2015). The researcher’s beliefs and assumptions were managed to limit their influence on the study. An in-depth methodological description was employed to allow the integrity of research results to be examined, and institutional approval was obtained. Chowdhury (2015) suggests that diagrams can also be adapted to demonstrate an “audit trail” (Chowdhury, 2015).

3.11 Ethical considerations

The viability of a research problem should be tested in the light of practical considerations such as time, availability of participants, financial resources, services and equipment, experience of the researcher, willingness of participants to engage in the study and ethical issues (Nirmala V, Edison, & Suni, 2011). A

research topic may be researchable and significant yet inappropriate if the research project is not viable (Nirmala V, Edison, & Suni, 2011).

3.11.1 Ethical consideration

This research is complied with regulations specified by the Wits Business School Research Ethics Committee and the employees in the South African coal mining sector. The researcher applied for ethical clearance certificate which was approved by the Ethics Committee Welfare to ensure any potential conflicts of interest which could arise are addressed prior to the commencement of the survey. Privacy and the rights of the participants will be protected by the researcher.

3.11.2 Informed consent

An informed consent is obtained when the researcher gives participants all key information needed for them to partake in the research project. Information such as the purpose of the research, what the researcher requires from them for the research, why they were selected to be participants in the research, has to be available to the participants. A healthy communication channel is required between the researcher and the participants for information flow (Manti & Licari, 2018). For this research, informed consent is outlined in Appendix B.

3.11.3 Confidentiality and anonymity

Confidentiality is when the researcher is aware of the participants identity but rather choose to withhold it to protect the participant's privacy. Anonymity can be obtained when the researcher does not know the participants' identity (Pezaro, Clyne & Gerada (2018). Confidentiality and anonymity are both essential to protect participants' privacy (Pezaro et al., 2018).

3.11.4 Right to privacy

Participants' rights to privacy should be respected and protected by researchers to preserve the validity of the research. Participants may refuse to be interviewed, particularly if they think their rights are dishonoured, hence the participants much participate voluntarily (Joe, Raben, and Phillips, 2016).

3.11.5 Institutional permission

Institutional permission should be obtained by sending a written letter to Human Resources manager to ensure no conflict of interest was brought by the research (Joe, Raben, and Phillips, 2016).

3.11.6 Providing the right to withdraw

Participants have been given an option to withdraw from participating in the research anytime they desired to, even though they may have started with the interview. Participants who chose to withdraw from participating in the research were not pressured or intimidated for stopping.

3.11.7 Minimise the risk of harm

A research project should not pose any risks to participants in any manner such as physical, psychological, socially, financially, and invasion of privacy. Should there be a possibility of such, participants should be informed so they can continue voluntarily or take an informed decision.

Table 3.2. Consistency table: research propositions, data collection and data analysis

RQ #	State Objective	Prop #	State Proposition	Data collection detail	Data analysis method
1	To evaluate employment benefits of the JET for employees in the coal mining sector in South Africa.	1.	Employment benefits created by the JET for employees in the coal mining sector in South Africa include changes in government policies, private enterprise participation, leveraging on international funding, constant consultation with labour unions, and job creation and substitution.	Interview guide questions 1, 2, 5, 6, 7, 9, 10, 14, 19, 20	Thematic analysis
2.	To analyse employment challenges from the JET faced by the employees in the coal mining sector in South Africa.	2.	Employees in the coal mining sector in South Africa do face challenges such as job losses, poor stakeholder management, political risks, financial barriers, private sector's lack of involvement, and lack of governmental support.	Interview guide questions 8, 11, 12, 13, 15, 16, 21, 22, 23, 24	Thematic analysis
3.	To examine forms of organisational employee support in the JET for	3.	Various forms of organisational employee support for employees in the coal mining sector in South	Interview guide questions 3, 4, 17, 18	Thematic analysis

RQ #	State Objective	Prop #	State Proposition	Data collection detail	Data analysis method
	employees in the coal mining sector in South Africa.		African JET include employee financial support, and addressing employee upskilling and reskilling needs.		

CHAPTER 4. PRESENTATION OF FINDINGS & DISCUSSION

4.1 Introduction

This chapter is the presentation of the findings and the discussion thereof. Interviews were conducted to collect data after which thematic analysis was employed to analyse interviewees' verbal responses. This chapter visually outlines how codes and themes were developed through thematic analysis to analyse the collected data. Findings are discussed in light of the previous research findings and existing literature to identify similarities and differences between the findings of this study and those of previous studies. The results and findings of each proposition are discussed individually to give a good reflection of each proposition. Each proposition has sub-headings which were derived from codes and themes to give a better view of interviewees' responses.

4.2 Demographic profile of participants

Of the ten (10) participants interviewed, four (4) were males and six (6) were females. Seven (7) were between ages thirty-one (31) to forty (40), and the remaining thirty (30) were between ages forty-one (41) to fifty (50). Seven (7) of the participants were black, two (2) were white and one (1) was coloured. Only three (3) of the participants had a Master's degree, one (1) had a Post Grad Diploma, five (5) had a degree and the last one (1) had a certificate. All participants were permanent employees. Two (2) of the employees were in senior management positions, three (3) were engineers, two (2) were in the administration, one (1) was a union representative, and the remaining two (2) were general workers.

4.3 Results pertaining to Proposition 1

4.3.1 Introduction

Proposition 1 was “To evaluate employment benefits of the JET for employees in the coal mining sector in South Africa”. According to the data collected, Proposition 1 has the following themes and codes which are highlighted in the sub-headings below:

4.3.2 Retraining, re-skilling, and up-skilling

Table 4.1. Retraining, re-skilling, and up-skilling

Theme	Codes
Retraining, re-skilling, and up-skilling	• New and exciting career opportunities; • Effort-based career development, being open to learning new skills; • Alternative employment opportunities; • Research and development; • Improved technologies, innovation; • Local learning institutions should drive skills development programmes; • Skills from the coal mining sector could be applied in other sectors, including the renewable space; • Reskilling should be offered in our tertiary education levels to prepare future RE employees; • Training & and development will play a major role in supporting employees within the coal mining sector.

Table 4.1 shows results pertaining to subheading 4.3.2 which is retraining, re-skilling, and up-skilling. Participants cited new skills development opportunities as the main benefit of the JET. An example a participant said “The JET should create new career opportunities”. Employees will have to be retrained, reskilled, and upskilled to be employable in the renewable energy sector at institutions of higher learning. A participant is quoted saying “New JET skills should be taught at varsity level”. They will learn about research and development, innovation, and

renewable energy technologies. A participant is quoted saying “Technology should be employed in research activities”. Hence, new career opportunities. However, employees who are open to learning new skills and applying effort in the process of reskilling will benefit from alternative opportunities in the renewable energy sector. Also, some of the skills from the coal mining sector will be applied in renewable energy sector jobs, therefore coal mining sector experience is essential.

4.3.3 Enhanced quality of life

Table 4.2. Enhanced quality of life

Table 4.2 shows results pertaining to subheading 4.3.3 Enhanced quality of life.

Theme	Codes
Enhanced quality of life	• Reduced energy bills due to the low cost of power generation; • Improve energy system reliability; • Reduced energy bills; • Improved economy; • No load shedding; • Enhanced quality of life; • More jobs.

According to participants, the JET will reduce the costs of generating electricity, thereby reducing energy bills for the South African population as natural resources will be major elements in energy generation. It will bring about an overall reliable energy where load shedding will cease to exist. This will improve the country’s economy, generate more jobs, and thus lower crime rate. For example a participant is quoted saying -“JET will improve energy supply reliability, thereby improving quality of life and creating more jobs, and there’ll be no loadshedding”.

4.3.4 Access to company and government support services

Table 4.3. Access to company and government support services

Table 4.3 shows results pertaining to subheading 4.3.4 Access to company and government support services.

Theme	Codes
Access to company and government support services	• Career counselling; • Job placement; • Employee reskilling and upskilling; • Attractive exit packages; • Access to affordable electricity; • Access to basic services, health care and sustainable human settlement; • Basic and higher education which is aligned with the future economy; • Employment incentives; • Access to training institutions.

Participants cited career counselling and job placement as some of the company and government support services brought about by the JET. A participant is quotes saying “The JET should open access to company support services such as career counselling, reskilling.” These job placements will be in the renewable energy sector, hence, access to training institutions, reskilling, and upskilling, is essential for employee marketability. Participants further cited that employees will have access to attractive exit packages in the coal mining sector and improved employment incentives in the renewable energy sector. These participants believe that they will have access to affordable electricity as the government provides incentives and support to households. An example of a participant quote is “The JET will provide better access to electricity”

The same participants cited that basic services, health care, and sustainable human settlement will be provided for by the government and by companies as

part of their JET and environmental, social, and corporate governance (ESG) obligations. They further claim that basic and higher education that is aligned with the future economy will be accessible to ensure relevance in the renewable energy sector.

4.3.5 Review of Government Policies

Table 4.4. Review of government policies

Table 4.4 shows results pertaining to subheading 4.3.5 Review of Government Policies.

Theme	Codes
Review of government policies	• Policies that enable renewable development in Mpumalanga to avoid net job losses; • Create an environment for continuous skills transfer; • Enable transmission grid which accommodates renewable energy; • Enable localised and sustainable value chain creation of renewable energy; • Provide renewable energy programmes through local institutions of higher learning; • Entrepreneurial development to access markets and networks.

Participants suggested that government policy reviews will favour former coal employees for new jobs that emerge in the renewable energy sector. These policies should include creating an environment for continuous skills transfer, where coal mining sector employees are reskilled and upskilled for renewable energy jobs. For example, a participant said “The transition should encourage review of government policies to promote reskilling in renewable programs at varsity level”.

The same policies should include the delivery of renewable energy programmes through local institutions of higher learning for easy accessibility. Such renewable energy programmes should also include entrepreneurial development for

budding entrepreneurs to access markets and networks. Participants further suggested that these policies should enable localised and sustainable value chain creation of renewable energy to ensure a developing economy and employment in renewable energy.

4.3.6 Effective reduction of carbon emissions

Table 4.5. Effective reduction of coal emission

Table 4.4 shows results pertaining to subheading 4.3.6 Effective reduction of carbon emissions.

Theme	Codes
Effective reduction of coal emission	• Clean energy; • Reduction in carbon emissions; • Reliable energy generation; • Reduction in overall global warming and its effects; • Improves air quality and consequently improves the health of the population.

Participants suggest that the JET will bring about benefits such as reduced carbon emissions and, hence cleaner air in the atmosphere. This will improve the health of the population at large and they will save on medical costs. Hence, longer lifespan. For example a participant said “The JET will provide clean energy, reliable electricity supply, reduce global warming, and improve quality of life”. Reliable energy generation will also be improved due to renewable energy generation technology.

4.3.7 Conclusion

A just energy transition recognizes the importance of not leaving workers behind and ensuring that the benefits of the transition are shared equitably. The just transition therefore makes fairness to all parties affected a condition or a guide in how the transition is done. That in itself is a benefit to employees. They can

expect not to end up disadvantaged. Participants from the coal mining sector indicated that employee benefits brought about by the JET include being retrained, re-skilled, and up-skilled for new career opportunities in the renewable energy sector. This can be achieved when the government and private sector invest financially in employee retraining, re-skilling, and up-skilling.

Government and companies can also support employees by generating employment opportunities from the general development of communities stimulated by new sectors. They can also invest in building new schools, health facilities, and other infrastructures. Hence, the a necessity for government policy review to ensure the realisation of the employee benefits from the JET.

4.3.8 Discussion *pertaining to Proposition 1*

a. Job creation and substitution

Kuriyama and Abe (2021) state that transitioning to renewable energy could increase employment by 1.13 per cent per year between 2010 and 2030. South Africa's energy transition will add more jobs than will be lost (Kuriyama & Abe, 2021). Bulavskaya and Reynès (2018) support this by claiming that renewable energy in power generation and heat generation can potentially create more jobs and career growth compared to gas and coal plants (Bulavskaya & Reynès,2018). Pegels and Lütkenhorst, 2014 further support this by indicating that although most jobs will be created in solar PV and wind energy, however, additional jobs will come from maintenance and operation services in the renewable energy sector (Pegels & Lütkenhorst, 2014). This correlates with participants' narratives that the JET will offer new and exciting job opportunities in the renewable energy sector. However, such jobs require the willingness to be reskilled and upskilled and a certain level of effort and determination is required from employees to be successfully trained.

Kuriyama and Abe (2021) suggest that these additional jobs require new skills and competencies. This narrative corresponds with the collected data narrative

which indicates that renewable energy jobs will require skills development programs to reskill and upskill coal mining sector employees. They further indicate that skills development should be offered by companies and in local tertiary education institutes for easy accessibility. These employees claim that they should be given an environment which promotes research development, and innovation to create jobs in the renewable energy sector.

b. Changes in government policies

The government's policies have to be reviewed to manage challenges faced by the coal mining sector employees in the energy transition in South Africa. Sharpe and Martinez-Fernandez (2021) suggest that a government policy review is necessary to assess the readiness of coal mining sector employees for jobs in the renewable energy sector, to improve transparency, to provide job opportunities, and to enable local renewable energy economy, and to provide opportunities for reskilling and upskilling to close any existing gaps amongst coal mining sector employees (Sharpe & Martinez-Fernandez, 2021).

This corresponds with the collected data which suggests that reviewed government policies should create an environment for learning and continuous skills transfer. This can be done through institutions of higher learning and company training centres. These policies should enable local economic development in affected areas through the creation of a localised and sustainable value chain of renewable energy.

Sharpe and Martinez-Fernandez (2021) imply that reviewed policies should include different sectors such as development employment policy, industry policy, sectoral level policies, and training and skills development policy. This will warrant policy coherence and coordination which are necessary for successful implementation of the same (Sharpe & Martinez-Fernandez, 2021). Galgócz (2019) submits that the same energy policy should determine the country's future basic infrastructure. Well-planned basic infrastructure translates to better economic restructuring which directly impacts employment (Galgócz, 2019).

This correlates with the collected data which indicates that the economy can be improved in these affected areas by offering entrepreneurial development programmes to enable employees to create alternative employment opportunities.

Pegels and Lütkenhorst (2014) support this by claiming that energy policies should aim to promote competitiveness, stakeholder management, job creation, mitigate climate change, minimising costs to consumers, influence trade position and long-term technological trajectory, and enhance sectoral diversification patterns. Such are considered the cornerstone of the country's economy (Pegels & Lütkenhorst, 2014).

c. Private enterprise participation

South African government established the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) to diversify energy generation capacity in South Africa. Independent Power Producers (IPPs) participate in this programme which is meant to contribute towards the country's power generation (DMRE, 2019). These IPPs source their funds, equipment, and labour to build power generation plants. However, the scarcity of skilled resources in the country is a hurdle hence these IPPs turned to international service providers for resources (DMRE, DTIC, & DSI, 2022).

Collected data agrees with this narrative that private sector participation in the transition is an advantage as they have the required skills and do not rely on the government for funding renewable energy projects.

Wentworth and Makokera (2015) claim that South Africa's resources such as steel and cement are sufficient for the manufacturing of wind turbines and blades. Therefore, it is possible to locally manufacture, install, and maintain renewable energy technology by developing the necessary skills, thereby creating jobs in the renewable energy sector (Wentworth & Makokera, 2015).

This is in agreement with the collected data which suggests that job creation can be achieved by creating a localised and sustainable value chain of renewable energy. The country is rich in natural resources, therefore renewable energy value chain can be completed locally.

d. Financing the JET

Lowitt (2021) suggests that leveraging International Finance Institutions (IFIs) such as DFI and Green Climate Fund can be done by governments to increase mobilisation and deployment of just transition funding. Therefore, the South African government should leverage IFIs to impact the technical skills on existing stakeholders in local financial institutions to enhance their financial skills needed for a just transition in South Africa (Lowitt, 2021). Minas (2022) supports this by implying that International Finance Institutions (IFIs) funds should be spent on enhancing human resource capacity and economic diversification rather than focusing only on financing climate mitigation (Minas, 2022).

This narrative correlates with the collected data which suggests that IFIs bring about an advantage of supporting the JET with no repayment expectation where IFI grants are given. Hence, the government should take full advantage of IFIs to advance the JET programme and objectives.

Muhammad and Christi (2023) suggest that the JET could be financed through the involvement of the private sector, banks, trade unions, and development banks. Such blended finance is essential for transitioning to renewable energy. However, public funds are more critical for infrastructure development and attracting private investment through grants, concessional loans, sovereign guarantees, and political risk guarantees (Muhammad & Christi, 2023).

Collected data indicate that coal mining sector employees believe that the private sector’s lack of involvement could be a result of unaffordability to invest due to dire economic conditions. These private companies may also fear a lack of return on investment and government corruption as government officials may misuse funds meant for the energy transition.

Hence, the need for the private sector to work with the national government, policymakers, regulators and financial authorities to generate a strategic framework which will maximise investments and create opportunities for investors to invest in renewable energy in a controlled and monitored environment (Lowitt, 2021).

e. Conclusion

Job creation and substitution is an advantage brought about by the energy transition. Not only job creation but also entrepreneurship opportunities. However, these can be realised with the support of government and companies. Hence, government-reviewed policies to promote the reskilling of coal mining sector employees and to promote the inclusion of the private sector in the energy transition can assist in realising a just transition.

4.4 Results pertaining to Proposition 2

4.4.1 Introduction

Proposition 2 is “To analyse employment challenges from the JET faced by the employees in the coal mining sector in South Africa”. The following themes and codes which are highlighted in the sub-headings below have been sourced from the data collected.

4.4.2 Job losses

Table 4.6. Job losses

Table 4.6 shows results pertaining to subheading 4.4.2 Job losses.

Theme	Codes

Job losses	- Stress induced by job losses; - Not enough skilled people for RE; - Unskilled employees could be irrelevant and lose jobs; - Different terms and rewards in the renewable energy sector; - Job losses; - limited number of industries for alternative jobs; - overseas expertise; - Poor economy; High dependence on government grants. - Employee unwellness; - Elevated levels of poverty and inequality; - Increased crime levels;

Participants indicated that challenges brought about by the JET include job losses. These job losses are due to decreasing demand for coal as the country and the world transition to renewable energy. For example, a participant is quoted saying “JET can result in job losses and poor economy which can cause stress”. Another reason for job losses is that although coal mining sector employees will be reskilled and upskilled, not all coal mining sector employees will be absorbed by the renewable energy sector. This is due to the nature of renewable energy technology which does not require a lot of manpower compared to coal mining sector technology.

Participants further indicated that high job losses are driven by a limited number of alternative industries in the country which can absorb coal mining sector employees. For example a participant said “There are limited jobs in renewable energy sector”. Also, renewable energy manufacturing largely depends on overseas expertise. This resulted in the country having to import renewable energy workers from overseas while leaving South African employees jobless.

These participants additionally suggested that job insecurity leads to stress and anxiety which develops to employee unwellness and ill health as family finances become unstable. This instigates poverty and increases levels of inequality which results in high levels of crime. A participant is quoted saying “Lack of employment can increase crime levels in the country”. The country’s economy will become poor due to the high unemployment rate and more citizens will depend on the government grant.

4.4.3 Redeployment

Table 4.7. Redeployment

Table 4.7 shows results pertaining to subheading 4.4.3 Redeployment.

Theme	Codes
Redeployment	- Unwillingness to relocate the family; - Concerns about the family's health and general well-being; - Concerned about age; Concerned about school-going kids.

Collected data suggests that coal mining sector employees may have to be redeployed to renewable energy sites as most renewable energy jobs may not be in cities and provinces where coal mining sector jobs are. Employees who have families may find this difficult to accept as there are many factors to consider when relocating with family, such as; employee age, schools for children, job security, level of income, family health, and general family well-being. Employees who are approaching retirement may opt for early retirement packages rather than relocate. Other employees may not want to relocate due to ill health, and also due to the level of income in new renewable jobs which do not meet their expectations. For example a participant is quoted saying that “The JET will force families to relocate, which means new schools for kids”. Another participant said “Age and health is a big concern because people do not like to relocate”.

4.4.4 Government’s Lack of transparency

Table 4.8. Government lack of transparency

Table 4.8 shows results pertaining to subheading 4.4.4 Government’s Lack of transparency.

Theme	Codes

Government lack of transparency	- Poor information sharing; - Poor employee engagement; - No clear government plans in terms of executing the JET in a just way; - Poor visibility of government officials; - Workers are not given a voice in the decision-making process during the energy transition; - Lack of tangible developments and benefits of the JET to build employee trust; - Lack of engagement with district and local governance; - Lack of honesty and transparency in financial reporting; - Centralised power systems.

Participants expressed their frustration in terms of the South African government's lack of transparency about the JET. They claim that there are no employee engagements, instead they gather some information regarding the JET from the media. This information is never sufficient to answer their questions. A participant is quoted saying "Government is not transparent about the JET, not enough information shared with the public particularly laypersons and employees". Participants further claim that coal mining sector employees are not given a voice in decision-making processes during the energy transition, and district and local governance are not involved in decision-making due to centralised power structures. They further maintain that transparency and honesty do not exist in financial reporting and government bodies are not visible locally to respond to employees' concerns about the JET. The same participants also indicated that there are no tangible developments and benefits of the JET, therefore, employees lack trust in the JET to provide a fair and just transition. for example a participant said "There are no clear plans on the government side"

4.4.5 Lack of funding

Table 4.9. Lack of funding

Theme	Codes

Lack of funding	- Lack of financial support from government for employee retraining, reskilling, and upskilling; - Government debt; - Poor involvement of the private sector to financially invest in employee re-skilling to ensure employees are marketable in the RE sector; - Government and private sector's unaffordability to invest in the JET; - Lack of return on this investment at a later time; - Poor economic climate; - Possible corruption and misuse of international funds.

Table 4.9 shows results pertaining to subheading 4.4.5 Lack of funding.

Participants further suggest that the government cannot fund the JET alone due to current debt and liabilities. Hence, the need to approach private and international funders. However, participants suggest that the private sector's lack of involvement may be due to unaffordability to invest in the energy transition due to the current poor economy. A participant said "Employees are not supported in terms of training for renewable energy which may be due to government and businesses not affording the transition to renewable energy". The private sector may also fear not getting a return on investment due to poor governance or corruption in government departments. For example a participant said "Government could misuse funds received from international funders". The government has a potential to redirect the internationally sourced funds for the JET for other purposes or may misuse the funds through corruption.

4.4.6 Unwillingness to be retrained

Table 4.10. Unwillingness to be retrained

Theme	Codes
	- Upskilling might put stress or challenges on the current workforce; - No interest to work in RE or to be retrained;

Unwillingness to be retrained	- Different culture, working conditions and rewards; - Require changes in mindset; - Require openness to change; - Could be difficult to train general workers and other employees in the coal mining sector due to their skill level.

Table 4.10 shows results pertaining to subheading 4.4.6 Unwillingness to be retrained.

Participants indicated that coal mining sector employees are not willing to be retrained, reskilled, and upskilled in the renewable energy sector as they feel that they are too old to start new careers. For example a participant is quoted saying “Employees are unwilling to be trained in renewable energy as they complain that they are old to be trained’. Some employees have low morale as they see themselves as not fit for renewable energy jobs due to the level of skills they possess. These employees are not open to change and are not interested in developing themselves. They are preparing themselves for the outcome of losing their jobs.

Participants also claim that renewable energy sector jobs may have a different culture and working conditions which might require one to adjust to. A participant is quoted saying “RE brings about a new different culture”. This means they may have to unlearn their existing culture and identity built around coal to adapt to renewable energy culture. These employees are uncertain about the future and are not willing to explore the unknown.

4.4.7 Conclusion

Employees in the coal mining sector are mainly concerned about job losses and how reskilling and upskilling will be implemented. They complain about a lack of transparency on the government side, they cite poor visibility of government officials and lack of employee engagement. These employees fear redeployment and also blame government officials for corruption and misuse of funds meant for the JET.

4.4.8 Discussion pertaining to Proposition 2

a. Job losses and associated social risks

As the country transitions to renewable energy, some coal mining sector jobs will not be relevant in the renewable energy sector due to the existing skills gap between coal mining sector employees and renewable energy sector employees (JET-IP, 2022). The existing skills gap makes coal mining sector employees unemployable without being retrained, reskilled, and upskilled in the renewable energy sector (Banerjee & Schuitema, 2022). Kuriyama and Abe (2021) support this statement by claiming that employees whose skills are in less demand are prone to job losses.

Collected data concurs with this narrative that coal mining sector employees are not skilled for renewable energy jobs. Hence, these employees are at risk of losing their jobs and not getting replacement jobs provided they get reskilled for renewable energy sector jobs.

Banerjee and Schuitema (2022) suggest that the main challenge for these employees is to find alternative employment due to a limited number of industries which can absorb them (Banerjee & Schuitema, 2022).

Collected data correlates with this by indicating that the country has limited industries which can make use of the skills which the coal mining sector employees possess. For this reason, they are not marketable in other industries.

Another challenge is that renewable energy technology is largely dependent on overseas expertise for design and manufacturing. This limits the chances of having local employees trained and skilled in renewable technology (Todd & McCauley, 2021).

This is in agreement with collected data which suggests that the lack of renewable energy expertise in the country drives the government to seek this talent overseas to advance energy transition. Hence, high unemployment levels in the country, contribute to poverty and consequently high crime rates.

Banerjee and Schuitema (2022) agree with this by narrating that coal mining sector employees will lose their jobs and depend on governmental public support programmes which in turn put pressure on the government's financial resources. This has the potential to drive the country's economy down, increase social and political instability, elevate inequality, and bring about poverty (Banerjee & Schuitema, 2022).

Galgócz (2019) further emphasises that renewable energy job creation may not happen at the same time and pace as the loss of jobs in the coal mining sector. Jobs in the coal mining sector will be lost and renewable energy jobs will emerge to replace the lost coal mining sector jobs at a desynchronised rate. This will leave coal mining sector employees at risk related to re-employment, relocation, job substitution, and managing their exit from the labour force (Galgócz, 2019).

Data collected through the interviews agrees that there is a delay in reskilling employees for renewable jobs due to the government's lack of urgency in implementing the JET. This results in delays in terms of employee replacement in renewable energy jobs.

b. Poor stakeholder management

Collected data indicate that employees are in the dark about the JET, they claim that they are not consulted by the government for information sharing and to hear their views about the JET.

Worrall et al. (2018) suggest that the government should enable platforms for dialogue across all stakeholders who will be affected by the JET. Stakeholders such as national and local government, the private sector, labour unions, SOEs, transport, the finance sector, and civil society (Todd & McCauley, 2021). This is to ensure that every stakeholder's voice is heard in the planning and policy-making processes, thereby encouraging policy coherence (Worrall et al., 2018). However, some stakeholders are more influential than others, such as organised labour or mining unions which are politically influential and can fight for the rights of their members (Todd & McCauley, 2021)

Collected data confirms that labour unions are the driving force behind workers' rights, they are the middleman between employers and employees, and they jealously guard employees' rights. Collected data further suggests that labour unions can be politically influenced to drive certain individual's agendas. Hence, it is necessary to get labour unions' support in the JET implementation program.

c. The private sector's lack of involvement

Parker (2023) suggests that there has been insufficient interaction between the South African government and the private sector concerning the current economic state of the country's energy generation. This is due to the government's lack of trust in the private sector to fairly participate in areas of the energy sector as the government wants total control of the energy sector. This is despite having no capability to manage or operate the same. Such capacity essentially remains with the private sector (Parker, 2023).

However, according to collected data, coal mining sector employees claim that the government is controlled by the private sector and business owners in the energy sector who enrich themselves through corruption at the cost of the same employees who are at risk of losing jobs.

However, the country currently faces load shedding, which contributes to a high unemployment rate, increased inequality, and poor economic growth. Hence, the government should be willing to involve the private sector in its mitigation plan (Parker, 2023).

Collected data suggests that the private sector should be involved as part of the solution formulation, however, their involvement should be monitored to prevent corruption.

d. Financial Barriers

South African government does not collect sufficient tax from corporate and income tax, hence, the government is parsimonious when it comes to spending. This is also evident in the recent government's call to government departments to halt further spending and announce implementation of budget cuts in 2024. Hence, donor funding is essential to assist in funding energy transition (Dolley, Fengu, Heywood, & Mahlaka, 2023).

This correlates with collected data which suggests that the government does not have the ability to fund the JET due to existing government debt and liabilities. Hence, the recent announcement of budget cuts in government departments.

Donor funding is difficult to get locally due to the country's high debt. Local funders are unable to grant funding due to the government's inability to underwrite their losses, therefore the government is relying on international funders to advance the JET (Lowitt & Levin, 2021).

This correlates with the collected data, which indicates that coal mining sector employees wish for the government to get financial resources from international funders. Such funds should be disseminated to relevant institutions to advance the reskilling and upskilling of coal mining sector employees in preparation for renewable energy jobs.

Other barriers to local funding are that local private sector funds well-established projects which pose a low risk and have predictable financial returns (Lowitt, 2021). These obstacles collectively amount to structural barriers which prevent just and fair energy transition and consequently prevent job creation in the renewable energy sector (Lowitt & Levin, 2021).

This correlated with collected data which suggests that lack of private funding is a fundamental barrier which impedes the implementation of a just and fair transition.

e. Conclusion

Job losses are the major challenge with regard to the JET. The main concern is; whether is the JET just and fair. Many coal mining sector employees stand a risk of losing their jobs without any replacement jobs in the renewable energy sector. The possibility is that not all coal mining sector employees will be absorbed by the renewable energy sector due to a lack of correct skills. Political influence may also creep in and cloud the government's judgement and decision-making in the energy transition process. The government has also been accused of poor stakeholder management which is essential and without which the transition cannot be just. This creates an undesirable portrait of the government to employees in the coal mining sector.

4.5 Results pertaining to Proposition 3

4.5.1 Introduction

Proposition 3 is "To examine forms of organisational employee support in the JET for employees in the coal mining sector in South Africa". According to the data collected, Proposition 3 has the following themes and codes which are highlighted in the sub-headings below:

4.5.2 Employee re-skilling and upskilling

Table 4.11. Employee re-skilling and upskilling

Theme	Codes
Employee re-skilling and upskilling	- Companies can support by expanding learning curriculum to cater for renewable energy; - Companies to work with the government and invest in technologies to address climate change, inequality, and unemployment;

	- Organisations should invest in upskilling and reskilling of people to keep people employed; - Providing information on job and other income opportunities. - Job placement

Table 4.11 shows results pertaining to subheading 4.5.2 Employee re-skilling and upskilling.

Coal mining sector employees indicate that companies should create means to place employees in alternative jobs in the renewable energy sector. These companies should invest in renewable energy technologies to upskill and reskilling employees in readiness for renewable energy jobs. A participant said “Businesses should incorporate technology in their strategies to address climate change and loss of employment and organisations should train employees to be employable in other job opportunities”. Training institutions should be established for research and development and to train employees in renewable energy technologies to improve their chances of being employable. A participant is quoted saying “Renewable energy should form part of the curriculum at institutions of higher learning”.

4.5.3 Change management

Table 4.12. Change management

Table 4.12 shows results pertaining to subheading 4.5.3 Change management.

Theme	Codes
Change management	- Organisations need to offer employees emotional and psychological support; - Change management needs to be provided on all levels; - Involve employees in decision-making to build trust; - Allow sufficient time and support for adaptation; - Ethical and people-oriented approach.

Participants suggest that change management should be applied while transitioning to renewable energy. Organisations need to offer employees emotional and psychological support to ensure employee well-being. For example a participant said “Counselling should be offered to employees to manage the transition well”. Another participant said “Employees should be consulted and not kept in the dark about the transition” These employees should be given enough time to process and adapt to the transition by being informed well in advance prior to its implementation. counselling services should be offered to warrant employee mental health.

4.5.4 Employee financial support

Table 4.13. Employee financial support

Table 4.13 shows results pertaining to subheading 4.5.4 Employee financial support.

Theme	Codes
Employee financial support	- Sufficient employee financial remuneration; - Financial support for non-permanent employees; - Investing in new economic activities in affected communities; - Companies can offer employees early retirement packages when they lose their job in the transition.

Coal mining sector employees advised that financial support is also expected from organisations, particularly for employees whose jobs will be obsolete. Unfortunately, some employees are not permanent, hence they cannot get all the financial support organisations can offer, such as early retirement packages. A participant is quoted saying “Early retirement packages should be offered as an option to all employees including non-permanent staff and Government should invest in alternative sectors where affected communities can be employed”. Organisations may not be able to offer financial support to employees due to low revenue as a result of low coal demand as the world tries to transition to renewable energy. Poor coal demand results in less mining activities, less

production, and consequently less revenue. Hence government should invest in alternative sectors for job creation purposes.

4.5.5 Investing in new economic activities in affected communities

Table 4.14. Investing in new economic activities in affected communities

Table 4.14 shows results pertaining to subheading 4.5.5 Investing in new economic activities in affected communities.

Theme	Codes
Investing in new economic activities in affected communities	- Investing in new economic activities in affected communities; - Career development opportunities in alternative economic activities such as, agricultural activities; - Job placement support in alternative economic activities; - Companies to work with the government and invest in technologies to boost alternative economic activities.

Participants indicated that companies could invest in alternative economic activities in affected communities. This is to warrant employee job placement in other economic activities should they not be absorbed in the renewable energy sector. A participant is quoted saying “Government should invest in alternative sectors where affected communities can be employed. And government should work with businesses to promote technology driven economic activities”.

4.5.6 Organisational Transparency

Table 4.15. *Organisational Transparency*

Table 4.15 shows results pertaining to subheading 4.5.6 Organisational Transparency.

Theme	Codes

Organisational Transparency	- Organisations need to be transparent about how the JET will affect employee jobs; - Organisations should get labour unions' support to avoid labour disputes and industrial actions; - Involve employees in decision-making to build trust.

Collected data suggest that employees need to know what is going on in their organisations, they have to be informed of whether the company is closing down due to the JET or for any other reason. Hence, management has to be transparent to gain employee trust and understanding. A participant is quoted sating “There is no transparency pertaining to the JET in our work environments, there is no efficient consultation with labour unions, and employees are left in the dark when it comes to the JET subject”. When employees are part of the JET process, they can apply their minds and not seek unreasonable demands. Labour unions also have to be included in decision-making as they are influential and can promote industrial action due to disagreements between employers and employees.

4.5.7 Conclusion

Organisational employee support should be implemented in terms of providing opportunities for employees to be reskilled and upskilled in preparation for the JET. These employees need financial support in terms of early retirement, medical aid, and retrenchment packages. However, not all organisations will be able to afford these financial requirements, therefore other forms of support can be offered to employees such as change management. This can be offered as a means of emotionally supporting employees to withstand change. Hence, employees need to be involved in company strategy planning, through labour unions, to understand their needs and how they can be supported. Finally, organisations have to be transparent to gain employee trust in the JET.

4.5.8 Discussion pertaining to Proposition 3

a. Employee financial support

Collected data indicates that coal mining sector employees wish for organisations to financially support employees by offering early retirement funds for employees who choose not to be reskilled for renewable energy. Organisations should also offer attractive remuneration with benefits for reskilled employees to warrant employee self-sustenance.

JET-IP (2022) supports this by indicating that workers affected by the transition have to be provided with enhanced health packages, retirement packages, retrenchment packages, and continuous income support for social security (JET-IP, 2022). Sharpe and Martinez-Fernandez (2021) further suggest that measures should be in place to cushion workers and communities from the transition shock. Measures such as healthcare support, unemployment insurance fund, and premature retirement for elderly employees who are reaching their retirement years (Sharpe & Martinez-Fernandez, 2021).

However, collected data added that some employees are not permanent, hence they cannot get all the support organisations can offer, such as monetary incentives upon the end of their employment contracts. Collected data also indicates that coal mining sector employees think that organisations may not be able to offer financial support to employees due to low revenue as a result of poor coal demand as the world tries to transition to renewable energy. Poor coal demand results in less mining activities, less production, and consequently less revenue.

Nevertheless, Louie and Pearce (2016) indicate that giving exorbitant top management benefits should be discouraged as ordinary workers are losing their jobs. Hence, executives' salaries should be reasonable to gain workers and community support and to ensure workers have a socio-economically stable future (Louie & Pearce, 2016).

b. Addressing employee upskilling and reskilling needs

JET-IP (2022) claims that renewable energy can absorb all coal workers who lost their jobs during the JET once they undergo reskilling and retraining to acquire the skill set required for the renewable energy sector.

This contradicts claims by coal mining sector employees as per the collected data, they claim that the renewable energy sector will not absorb all coal mining sector employees due to the number of jobs renewable energy will create.

Government, educational institutions, and businesses should invest in renewable energy-related education to support new trades that participate in sustainable development and opulence (Gambhir et al., 2018).

This correlates with the collected data which suggests that coal mining sector employees wish that the government could provide training institutions to upskill coal mining sector employees in readiness for renewable energy jobs. Reskilling should also be offered at local existing institutions of higher learning and institutions of learning which are owned by these organisations for easy access.

c. Job Placement

Employees in the coal mining sector have expressed that they will have an opportunity to get new jobs in renewable energy sector upon completion of retraining, reskilling and upskilling. They imply that organisations can assist them in job placements whether in their current locations or in different cities.

d. Investing in entrepreneurial endeavours in affected communities

Collected data suggest that organisations should invest in entrepreneurial endeavours in affected communities to create additional jobs. Entrepreneurial activities could be in the manufacturing or installation of renewable energy infrastructure.

Wentworth and Makokera (2015) indicate that South Africa is well-resourced in terms of steel and cement which are critical for the manufacturing of turbines and wind blades. Therefore, these renewable energy components should be manufactured locally instead of being sourced overseas (Wentworth & Makokera, 2015).

Participants agree with this narrative by expressing that high job losses are driven by a limited number of alternative industries in the country which can absorb coal mining sector employees. Also, renewable energy manufacturing largely depends on overseas expertise. This resulted in the country having to import renewable energy workers from overseas while leaving South African employees jobless. Hence, the a need for entrepreneurial cultivation.

e. Organisational Transparency

Louie and Pearce (2016) express that employers in the coal mining sector industries should manage workers' perceptions. Workers should view their employers as though they have their best interests at heart. This is achieved through transparency.

Collected data correlates with this narrative by indicating that organisational transparency is essential to gaining employee trust. Employees need to be knowledgeable of what is unfolding in their organisations, and they need to hear this from their employers. They further express that lack of transparency can lead to labour unrest and unreasonable employee demands.

f. Change management

Change management should be applied while transitioning to renewable energy. Organisations need to offer employees emotional and psychological support to ensure employee well-being in the face of job losses. This will warrant employee emotional and mental stability to deal better with the transition.

g. Conclusion

It has been uncovered that organisational employee support can be financially in the form of enhanced health packages, retirement packages, retrenchment packages, continuous income support for social security, unemployment insurance funds, and premature retirement for elderly employees who are reaching their retirement years. However, emotional support is another form of organisational employee support where employees are equipped to manage change and be emotionally and mentally stable through the transition.

Organisations should also support their employees by offering skills development programmes to upskill employees for renewable energy jobs. This will assist in getting as many employees as possible in the renewable energy sector.

4.6 Summary of the findings

The JET poses both benefits and challenges for employees in the coal mining sector. Although energy transition may be a good initiative for the country to reduce GHG emissions, coal mining sector employees are the most negatively affected by the energy transition in terms of job losses. These coal mining sector employees argue that the JET is not just and fair as they are not consulted or informed about any decisions pertaining to their jobs in the JET implementation. Therefore, there is a lack of transparency. This is evident in the conflicting connotations between the existing literature and the findings of this research in terms of the absorption of coal mining sector employees into the renewable energy sector. Existing literature implies that all coal mining sector employees will be absorbed by the renewable energy sector whereas collected data indicates that not all coal mining sector employees will be absorbed by the renewable energy sector due to lack of skills development and less demand for manpower in operating and maintaining renewable energy technology.

Unfortunately, government does not have the funds required to implement JET in a manner that warrants renewable energy jobs for all coal mining sector employees. Hence, the a need to seek private sector assistance. However, barriers set by the government in the energy sector hamper the same private sector from participating effectively. Therefore, government policy review has to be implemented to allow full participation of the private sector in the energy transition.

Another potential hindrance in the JET implementation is political influence and corruption. The government has to develop a conducive environment for the implementation of the JET where corruption and political influence are harshly dealt with. This will institute coal mining sector employees' trust in the government to look after their needs.

4.7 Conclusion

Job creation and substitution are a possibility in the energy transition. This is achievable through reskilling and upskilling for renewable energy sector employees. Hence, the need for the government to implement policies which enable the provision of renewable energy programmes through local institutions of higher learning for accessibility. Job creation can also be achieved through the cultivation of entrepreneurial appetite and skills to assist entrepreneurs in accessing markets and networks. This will warrant localised and sustainable value chain creation of renewable energy and generate jobs in alternative industries.

The same policies should allow for the participation of the private sector in the energy transition. The private sector can provide support to the government such as power generation through IPPs. These IPPs are self-funded, therefore government will not be obligated to provide financial assistance. However, the private sector can only be fully involved in the JET if the government allows it. Being fully involved means that the private sector should be allowed to participate

in energy generation in terms of IPPs, and also to be able to fund government renewable energy projects where viable. Although the private sector prefers to fund established projects to manage potential risks, the government should provide surety in the form of assets to secure funding. Funding can also be sourced from IFIs to warrant the advancement of a just and fair energy transition as this grant funding does not require repayment.

In addition, employees can get organisational support using enhanced health packages, retirement packages, retrenchment packages, continuous income support for social security, unemployment insurance funds, and premature retirement for elderly employees who are reaching their retirement years. However, organisations should also offer emotional support where employees are equipped to manage change and be emotionally and mentally stable through the transitioning process.

However, to enable just and fair JET demands that government be cognisant and intentional about eradicating corruption and particularly political influence in its decision-making. Funding can be sourced and readily available, however, if not utilised for its designed purpose in terms of achieving the JET objectives, it is a fruitless exercise. This could result in coal mining sector employees losing their jobs with no potential replacement jobs. This will escalate poverty, elevate inequality, and consequently increase crime in the country.

4.8 Comparison of literature review and own findings

Table 4.16. Comparison of literature review and findings

RQ #	**State Research Objective**	**Prop #**	**State Proposition** (literature review response to RQ)	**Findings from own study**
1	To evaluate employment benefits of the JET for employees in the coal	1.	Employment benefits created by the JET for employees in the coal	Employee benefits brought about by the JET include being retrained, re-skilled,

RQ #	State Research Objective	Prop #	State Proposition (literature review response to RQ)	Findings from own study
	mining sector in South Africa.		mining sector in South Africa include changes in government policies, private enterprise participation, leveraging on international funding, constant consultation with labour unions, and job creation and substitution.	and up-skilled for new career opportunities in the renewable energy sector. This can be achieved when the government and the private sector invest financially in employee retraining, re-skilling, and up-skilling. Therefore, government support is vital in terms of information dispensation regarding the JET to guarantee transparency and review government policies to enable a fair and just transition.
2.	To analyse employment challenges from the JET faced by the employees in the coal mining sector in South Africa.	2.	Employees in the coal mining sector in South Africa do face challenges such as job losses, poor stakeholder management, political risks, financial barriers, the private sector's lack of involvement, and lack of governmental support.	Employees in the coal mining sector are primarily anxious about job losses and how reskilling and upskilling will be implemented by the government. Most of these employees complain about the lack of transparency on the government side and coal mining sector organisations. Employees are also concerned about redeployment and are anxious about being away from their families. Corruption is also mentioned as one of the major problems in the country where funds which are meant for the JET could be lost through government

RQ #	State Research Objective	Prop #	State Proposition (literature review response to RQ)	Findings from own study
				officials who rather enrich themselves at the expense of the poor.
3.	To examine forms of organisational employee support in the JET for employees in the coal mining sector in South Africa.	3.	Various forms of organisational employee support for employees in the coal mining sector in South African JET include employee financial support, and addressing employee upskilling and reskilling needs.	Organisational employee support should be offered in terms of employee reskilling and upskilling in preparation for the JET. Financial support in terms of retirement and retrenchment packages should also be offered. However, other forms of support can be by means of emotional support for employees to be able to withstand change. It has also been found that not all organisations will be able to afford these financial requirements due to low coal demand which results in low revenue. It has also been uncovered that organisations have to cultivate entrepreneurial appetite and skills in affected areas to create more job opportunities in alternative industries. Therefore, to win employee trust and improve chances of implementing a just transition, organisational transparency should be practised

CHAPTER 5. CONCLUSIONS & RECOMMENDATIONS

5.1 Introduction

This chapter outlines the conclusions and recommendations based on the findings for each of the propositions. Conclusions regarding questions 1, 2 and 3 will be will be summarised and highlighted to point out any noticeable differences between this research and previously published research. Subsequently, recommendations and suggestions for further research will be indicated at the end of this chapter.

5.2 Conclusions Regarding Research Objective 1

The first research object is “To evaluate employment benefits of the JET for employees in the coal mining sector in South Africa”. According to the collected data, the findings are that employment benefits created by the JET for employees in the coal mining sector include new job opportunities and employee skills development. Employees should be offered opportunities to be retrained, reskilled, and upskilled to be employable in the renewable energy sector. Reskilling and upskilling opportunities should be offered at local institutions of higher learning and also at organisations where coal mining sector employees are employed for easy accessibility.

South African government has to be supportive in terms of designing policies and guidelines to achieve employee reskilling. Such policies should encourage coal mining sector employers to reskill their employees to be employable in the renewable energy sector. The government’s support should also be evident through the offering of incentives such as, inter alia, tax exemption to organisations who contribute towards employee reskilling. Cultivation of entrepreneurial appetite and skills to assist entrepreneurs in accessing markets and networks is also a form of support which the government can implement. This will warrant localised and sustainable value chain creation of renewable energy and generate jobs in alternative industries.

The government ought to appeal to international funders to finance the JET in the country. Such funds should be allocated to relevant established institutions with clean audit records to advance the reskilling and upskilling of coal mining sector employees. The private sector should in addition provide financial support to advance employee reskilling. The supportive private sector could also be rewarded by being offered incentives in return by the government to encourage philanthropic practices.

The key difference identified between this research and previously published research is that coal mining sector employees acknowledge that the JET brings about entrepreneurship skills development. This assists in getting employees in new career paths which can create additional jobs for coal mining sector employees.

5.3 Conclusions Regarding Research Objective 2

The second objective is “To evaluate employment challenges of the JET for employees in the coal mining sector in South Africa”. According to the collected data, employee challenges include a high rate of unemployment as a result of job losses. Coal mining sector employees are not trained and skilled to work in the renewable energy sector, hence they are unable to find replacement jobs in such sector without being reskilled and upskilled.

Some coal mining sector employees are not willing to be retrained, reskilled, and upskilled in the renewable energy sector as they feel that they are too old to start new careers. These employees are not open to change and are not interested in developing themselves. They are organising themselves for the eventual outcome of losing their jobs and taking early retirements. Some employees have expressed that it may not be possible to reskill general workers and other employees at low levels of the corporate ladder due to their current skill level which may be irrelevant in the renewable energy sector.

For fortunate coal mining sector employees who get to be retrained, reskilled, and upskilled in the renewable energy sector, redeployment may be the change

they will have to embrace. Most renewable energy jobs may not be in cities and provinces where coal mining sector jobs currently are, hence redeployment. Collected data further indicates that employees who have families may find redeployment and relocation challenging to accept as there are many factors to consider when relocating with family, such as; schools for children, job security, level of income, family health, and general family well-being. Hence some employees may not take the offer should they feel that these factors are overlooked.

Employees in the coal mining sector also voice their frustration in terms of the South African government's lack of transparency about the JET. These employees express that the government may not fully comprehend the effects of the JET on employees in the coal mining sector. The same government may have no plans in place to save jobs in the coal mining sector or create new jobs in the renewable energy sector, hence the lack of transparency. Transparency is not fully applied by disseminating information through informational advertising, websites, seminars, media briefings, papers, gazettes, and involvement of both training/education and research institutions only, but by also engaging stakeholders in person. These stakeholders should include, inter alia, employees who are largely represented by labour unions. Clear guidelines, timelines, and practical implementation of the JET should be communicated.

Coal mining sector employees further claim that the government is ruled by business owners who enrich themselves through corruption while leaving employees at risk of being unemployed, hence government quickly forgot who voted them into power. These employees further indicate that the government should be independent and not controlled by external forces who don't have an interest in developing the country.

Collected data further indicate that the private sector's lack of involvement may be due to unaffordability to invest in the energy transition due to the global decreased demand for coal and due to the current poor economy which affects their revenue and cash flow. These organisations may also have fear of not getting a return on investment due to poor governance and corruption in

government departments. The government has the potential to redirect the internationally sourced funds for the JET for other purposes or may misuse the funds through corruption.

The key difference identified between this research and previously published research is that the private sector's lack of involvement may be due to their lack of affordability to invest in the energy transition due to the global decrease in demand for coal and due to the current poor economic climate. Another identified difference is that there is a possibility that JET funds could be lost through corruption which is highly prevalent among government officials in the country. Further difference is that employees at low levels of the corporate ladder such as, among others, general workers and coal truck drivers cannot be reskilled due to their current skills level which may be irrelevant in the renewable energy sector. The last key finding is that the government may have no plans in place on how to save jobs in the coal mining sector or create new jobs in the renewable energy sector, hence the lack of transparency.

5.4 Conclusions Regarding Research Objective 3

The third objective is "To examine forms of organisational employee support in the JET for employees in the coal mining sector in South Africa". Collected data indicate that organisational employee support can be offered in terms of investments in upskilling and reskilling employees in readiness for renewable energy jobs. These organisations should establish training institutions for research and development to train employees in renewable energy technologies to improve their chances of being employable.

Organisations should also offer change management seminars for employees emotional and psychological support while transitioning to renewable energy. Organisations need to ensure employee well-being is looked after during this major transformation.

Collected data further indicate that financial support is also expected from organisations, particularly for employees who are being retrenched.

Unfortunately, some employees are not permanent, hence they cannot get all the support organisations can offer to permanent employees, such as, among others early retirement funds. Also. organisations may not be able to offer financial support to employees due to low revenue as a result of low coal demand as the world tries to transition to renewable energy. Poor coal demand results in less mining activities, less production, and consequently low revenue.

Transparency is another form of organisational support. Employees need to know what is going on in their organisations. The lack of strong awareness about the JET among employees implies insufficient organisational communication to employees about the JET. This general lack of deliberate orientation can result in ignorance or anxiety among employees which threatens to make the transition unjust to employees. Therefore, organisational management has to be transparent to gain employee trust and understanding. When employees are part of the JET process, they can apply their minds and not seek unreasonable demands.

The key difference identified between this research and previously published research is that change management should be applied while transitioning to renewable energy. Organisations need to offer employees emotional and psychological support to ensure employee well-being. Also, organisational transparency is almost non-existent. Coal mining sector organisations do not disseminate information to employees to keep them abreast of the JET.

5.5 Overall conclusion

Key differences have been identified between this research and previously published research. These narratives have been expressed by the coal mining sector employees. Government and organisations ought to assess these concerns to understand what employees require to deem the JET as just and fair and implement reviewed policies which address such concerns.

Table 5.1. Consistency table: research questions, conclusions and contribution to knowledge

RQ #	State Research Objective	State literature-based proposition	State conclusion based on own research	Highlight key differences between your initial propositions and your findings – this is your contribution to knowledge
1	To evaluate employment benefits of the JET for employees in the coal mining sector in South Africa.	Employment benefits created by the JET for employees in the coal mining sector in South Africa include changes in government policies, private enterprise participation, leveraging on international funding, constant consultation with labour unions, and job creation and substitution.	Employee benefits brought about by the JET include being retrained, re-skilled, and up-skilled for new career opportunities in the renewable energy sector. This can be achieved when the government and the private sector invest financially in skills development programs.	The key difference identified between this research and previously published research is that coal mining sector employees acknowledge that the JET brings about entrepreneurship skills development. This assists in getting employees in new career paths which can create additional jobs for coal mining sector employees.
2	To analyse employment challenges from the JET faced by the employees	Employees in the coal mining sector in South Africa do face challenges such as job losses, poor stakeholder	Employees in the coal mining sector are primarily anxious about job losses and how reskilling and upskilling will be	The key difference identified between this research and previously published research is that the private sector's lack of involvement may be due to their lack of affordability to invest in

RQ #	State Research Objective	State literature-based proposition	State conclusion based on own research	Highlight key differences between your initial propositions and your findings – this is your contribution to knowledge
	in the coal mining sector in South Africa.	management, political risks, financial barriers, the private sector's lack of involvement, and lack of governmental support.	implemented by the government. Most of these employees complain about the lack of transparency on the government side. They believe that the JET is only known by the senior management personnel in the coal mining sector and no information is shared with them. Other employees fear redeployment and are anxious about being away from their families, while others simply do not want to	the energy transition due to the global decrease in demand for coal and due to the current poor economic climate. Another identified difference is that there is a possibility that JET funds could be lost through corruption which is highly prevalent among government officials in the country. Further difference is that employees at low levels of the corporate ladder such as, among others, general workers and coal truck drivers cannot be reskilled due to their current skills level which may be irrelevant in the renewable energy sector. The last key finding is that the government may have no plans in place on how to save jobs in the coal mining sector or create new jobs in the

RQ #	State Research Objective	State literature-based proposition	State conclusion based on own research	Highlight key differences between your initial propositions and your findings – this is your contribution to knowledge
			be reskilled as they feel too old to start new career paths. Corruption is also mentioned as one of the major problems in the country where funds which are meant for the JET could be lost through government officials who rather enrich themselves at the expense of the poor.	renewable energy sector, hence the lack of transparency.
3	To examine forms of organisational employee support in the JET for employees in the coal mining sector in South Africa.	Various forms of organisational employee support for employees in the coal mining sector in South African JET include employee financial support, and addressing employee	Organisational employee support should be offered in terms of employees reskilling and upskilling in preparation for the JET. Financial support in terms of retirement and retrenchment packages should also be offered.	The key difference identified between this research and previously published research is that change management should be applied while transitioning to renewable energy. Organisations need to offer employees emotional and psychological support to ensure employee well-being.

RQ #	State Research Objective	State literature-based proposition	State conclusion based on own research	Highlight key differences between your initial propositions and your findings – this is your contribution to knowledge
		upskilling and reskilling needs.	However, not all organisations will be able to afford these financial requirements, therefore other forms of support can be by means of emotional support for employees to be able to withstand change. Organisational transparency should be the order of the day to win employees' trust.	Another difference is that coal mining sector organisations do not disseminate sufficient information to employees to keep them abreast of the JET. This threatens implementation of a just energy transition.

5.6 Recommendations

5.6.1 The South African fossil fuel workers, particularly workers in the coal mining sector

Coal mining sector employees should be open to change, particularly one that will benefit the country, its economy, and its citizens. These employees should be willing to be reskilled for renewable energy jobs to be employable in the renewable energy sector. They should be open to redeployment, particularly when there are no substitute jobs in their current locations.

5.6.2 The South African population in general

The South African population should embrace the transition from coal energy to renewable energy as it is of benefit in terms of sustainable and clean energy generation. They should learn to be cognizant of what is going on in the country by following the news and asking where necessary so they can be abreast and voice their opinions during stakeholder engagements.

5.6.3 The South African government

The South African government should be transparent in terms of dispensing information pertaining to the JET to every citizen, particularly coal mining sector employees. Clear plans and timelines should be in place and well communicated with every stakeholder. Government should also get rid of corruption as it hinders the growth of the country. They should support coal mining sector employees by providing locally accessible institutions for reskilling opportunities.

5.7 Suggestions for further research

Further research may attempt to find solutions to employee challenges induced by the JET implementation in the South African coal mining sector. While it is of

benefit to unearth the impact of the JET on employees in the coal mining sector, it is equally imperative to explore possible solutions to the discovered challenges and also exploit potential opportunities for the benefit of the employees.

Another study may seek to uncover the impacts of the JET on employees in indirect and induced jobs which are generated by the South African coal mining sector. Indirect and induced jobs such as, among others, coal truck drivers who are employed by companies which are contracted to the mine, may be displaced and lose their jobs. Therefore, the JET will not affect only employees who are directly employed in mines but also employees whose companies are contracted to mines.

Another study may be conducted on the impact of the JET on Eskom employees. Eskom employees may be directly affected by the JET as some of their power stations use coal to generate electricity. Hence, should the transition be implemented, there is a possibility of employees being displaced and losing jobs.

Future studies can also use multiple methods to benefit more from triangulation.

Another research can include other energy sector stakeholders. Employees may lack subject area expertise. It has been noted from the data collection that some coal mining sector employees are not knowledgeable in the area of the JET.

Another study can include sector experts who have better understanding of the subject matter.

Another study can investigate coal mining sector organisations' lack of transparency concerning the JET.

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APPENDIX A – Participant Information Sheet



Participant Information Sheet (PIS)

Dear Sir / Madam

My name is Zukiswa Njokwana. I am a Masters student in Energy Leadership at the University of the Witwatersrand, Johannesburg. My supervisor is Dr Kurai Chitima. I am conducting a research study about the implications of the Just Energy Transition for employees in the South African coal mining sector. The study title is Implications of the Just Energy Transition for employees in the South African coal mining sector.

I am inviting you to take part in an interview and answer a questionnaire. If you decide to take part, your participation in this research study will last about 10 minutes. The interview will take place at your workplace at after work.

The interview will be confidential and anonymous. When I share the results of the research study, I will not include your name or anything else that could identify you.

If you decide to take part in the research study, it should be because you want to volunteer. You do not have to take part. You can stop being in the study at any time. You do not have to answer any questions if you do not want to. You will not get any direct benefits if you choose to join the research study. You will not lose any services, benefits or rights you would normally have if you decide not to join.

Taking part in the research study will not cost you anything. You will not be paid for being in this research study.

The risks for this research study are no more than what happens in everyday life.

This research study will be written up as a research report. The report will be available on the university library website. If you would like to receive a summary of this report, I will be happy to send it to you.

If you have any questions during or afterwards about this research study, feel free to contact me or my supervisor on the details listed below. If you have any concerns or complaints about the ethical procedures of this research study, you are welcome to contact the University Human Research Ethics Committee (Non-Medical), telephone +27(0) 11 717 3976, email pius.oba@wits.ac.za.

Yours sincerely,

Zukiswa Njokwana

Researcher:

Zukiswa Njokwana, 2634806@students.wits.ac.za, 0824516895

Supervisor:

Dr Kurai Chitima, kuraic@gmail.com

APPENDIX B – Participant Agreement Form



Informed Consent Form

Dear Participant

The following is a sample consent form for a research project which I am conducting as a requirement to obtain a Master of Management in Energy Leadership qualification at Wits Business School. The topic for the research is: I**mplications of the just energy transition for employees in the South African coal mining sector.** The aim of the research is to explore implications of the Just Energy Transition on employees in the South African coal mining sector. Please fill in the consent form and email it back to me, should there be any questions please contact me at 2634806@students.wits.ac.za.

Consent to take part in research

 I…… voluntarily agree to participate in this research study.

 I understand that even if I agree to participate now, I can withdraw at any time or refuse to answer any question without any consequences of any kind.

 I understand that I can withdraw permission to use data from my interview within two weeks after the interview, in which case the material will be deleted.

 I have had the purpose and nature of the study explained to me in writing and I have had the opportunity to ask questions about the study.

 I understand that participation involves answering research questionnaire which will be emailed to me.

 I understand that I will not be paid for my participation.

 I understand that all information I provide for this study will be treated confidentially.

 I understand that in any report on the results of this research my identity will remain anonymous. This will be achieved by using questionnaire which don't require participant's name.

 I understand that extracts from my interview may be quoted in the treaties of the Principal Investigator (PI).

 I understand that signed consent forms will be retained safe by the PI for the duration of the research study until the exam office confirms the results of the treaties.

 I understand that I am free to contact the PI involved in the research to seek further clarification and information.

For further information please contact:

Principal Investigator: Zukiswa Njokwana

Email: 2634806@students.wits.ac.za

Your support will be greatly valued.

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Signature of participant Date

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Signature of researcher

APPENDIX C – Research Instrument

SECTION A: BIOGRAPHICAL INFORMATION

No.	Please indicate with an 'x' on the correct response.					
1	**Gender**	Male	Female			
2	**Ethnic group**	Black (African)	Coloured	White	Indian	Other
3	**Age**	Below 20 years	20-30 years	31-40 years	41-50 years	Above 50 years
4	**Highest Level of education**	Below Matric	Matric	Certificate	Diploma/degree	Post Grad
5	**Employment Status**	Permanent Employee	Contract Employee			

SECTION B: MAIN QUESTIONAIRRE

1. Do you know what is the Just Energy Transition (JET)? Please explain.
2. Do you consider the Just Energy Transition as just and fair? Please explain.
3. How do you think JET will affect employees in the South African coal mining sector?
4. Do you think organisations can provide employee support for the JET? How?
5. If yes, what kind of support can coal mines provide for employees in the South African coal mining sector?
6. Is the South African government transparent enough around the issue of the JET? Please elaborate.
7. What support can the South African government provide for employees in the coal mining sector?

8. Are there any employee benefits afforded by the JET? If yes, what are they?
9. What are the challenges brought by the JET to employees in the South African coal mining sector?
10. Should South African coal mining sector employees form part of stakeholders in the JET process? If yes, what role can they play?
11. Does the South African government yield to the concerns of employees in the coal mining sector? Please elaborate.
12. Are you willing to work in the renewable energy sector? Please give reasons.
13. Are you willing to relocate for a new job in renewable energy sector? Please elaborate.
14. Are you willing to be retrained to be employable in the renewable energy sector? Give reasons.
15. Does the JET create job losses in the South African coal mining sector? Give reasons.
16. Does the JET create social challenges in the South African coal mining sector?
17. If yes, what kind of social challenges are brought about by the JET in the South African coal mining sector?
18. What kind of employee financial support can be afforded by organisations to employees in the South African coal mining sector?
19. Can the renewable energy sector absorb all employees in the South African coal mining sector? Please explain.
20. How should government manage stakeholders in the JET process?
21. What kind of engagement should be practise for good stakeholder management in the South African coal mining sector?
22. Do you know what is the Just Energy Transition Investment Plan (JET-IP)? Please explain.
23. What does the JET-IP seek to address? Please elaborate.
24. What do you wish JET-IP could address? Please explain.

APPENDIX D – Qualitative Coding

Thematic Analysis

Themes	Codes
To evaluate employment benefits of the JET for employees in the coal mining sector in South Africa.	
Retraining, re-skilling, and up-skilling	• New and exciting career opportunities; • Effort-based career development, being open to learning new skills; • Alternative employment opportunities; • Research and development; • Improved technologies, innovation; • Local learning institutions should drive skills development programmes; • Skills from the coal mining sector could definitely be applied in other sectors, including the renewable space; • RE skilling should be offered in our tertiary education levels to prepare future RE employees; • Training & development will play a major role in supporting employees within the coal mining sector.
Enhanced quality of life	• Reduced energy bills due to low cost of power generation; • Improve energy system reliability; • Reduced energy bills; • Improved economy; • No load shedding; • Enhanced quality of life; • More jobs;
Access to company and government support services	• Career counselling; • Job placement; • Employee reskilling and upskilling; • Attractive exit packages; • Access to affordable electricity; • Access to basic services, health care and sustainable human settlement; • **B**asic and higher education which is aligned with future economy; • Employment incentives; • Access to training institutions.

Review of government policies	• Policies that enable renewable development in Mpumalanga to avoid net job losses; • Create an environment for continuous skills transfer; • Enable transmission grid which accommodates renewable energy; • Enable localised and sustainable value chain creation of renewable energy; • Provide renewable energy programmes through local institutions of higher learning; • Entrepreneurial development to access markets and networks.
Effective reduction of coal emission	• Clean energy; • Reduction in carbon emissions; • Reliable energy generation; • Reduction in overall global warming and its effects; • Improves air quality and consequently improves health of the population.
To analyse employment challenges from the JET faced by the employees in the coal mining sector in South Africa.	
Job losses	- Stress induced by job losses; - Not enough skilled people for RE; - Unskilled employees could be irrelevant and lose jobs; - Different terms and rewards in renewable energy sector; - Job losses; - limited number of industries for alternative jobs; - overseas expertise; - Poor economy; - Employee unwellness; - Elevated levels of poverty and inequality; - Increased crime levels; - High dependence on government grants.
Redeployment	- Unwillingness to relocate the family; - Concerns about the family health and general well-being; - Concerned about age; - Concerned about school going kids.
Government lack of transparency	- Poor information sharing; - Poor employee engagement; - No clear government plans in terms of executing the JET in a just way; - Poor visibility of government officials;

	- Workers are not given a voice in the decision-making process during the energy transition; - Lack of tangible developments and benefits of the JET to build employee trust; - Lack of engagement with district and local governance; - Lack of honesty and transparency in financial reporting; - Centralised power systems.
Lack of funding	- Lack of financial support from government for employee retraining, reskilling, and upskilling; - Government debt; - Poor involvement of private sector to financially invest in employee re-skilling to ensure employees are marketable in RE sector; - Government and private sector's unaffordability to invest in the JET; - Lack of return on this investment at a later time; - Poor economic climate; - Possible corruption and misuse of international funds.
Unwillingness to be retrained	- Upskilling might put stress or challenges on the current workforce; - No interest to work in RE or to be retrained; - Different culture, working conditions and rewards; - Require changes in mindset; - Require openness to change; - Could be difficult to train general workers and other employees in the coal mining sector due to their skills level.
To examine forms of organisational employee support in the JET for employees in the coal mining sector in South Africa.	
Employee re-skilling and upskilling	- Companies can support by expanding learning curriculum to cater for renewable energy; - Companies to work with government and invest in technologies to address climate change, inequality, unemployment; - organisations should invest in upskilling and reskilling of people to keep people employed; - Providing information on job and other income opportunities.
Change management	- Organisations need to offer employees emotional and psychological support; - Change management needs to be provided on all levels;

	- Involve employees in decision-making to build trust; - Allow sufficient time and support for adaptation; - Ethical and people-oriented approach.
Employee financial support	- Sufficient employee financial remuneration; - Financial support for non- permanent employees; - Investing in new economic activities in affected communities; - Financial support for non- permanent employees; - Companies can offer employees early retirement packages when they lose job in the transitioning.
Investing in new economic activities in affected communities	- Investing in new economic activities in affected communities; - Career development opportunities in alternative economic activities; - Job placement support in alternative economic activities; - Companies to work with government and invest in technologies to boost alternative economic activities.
Transparency	- Organisations need to be transparent about how the JET will affect employee jobs; - Organisations should get labour unions support to avoid labour disputes and industrial actions; - Involve employees in decision-making to build trust.

APPENDIX E – Ethics Approval

Graduate School of Business Administration
University of the Witwatersrand, Johannesburg

Wits Business School

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

Ethics Clearance Certificate

Ethics protocol number: WBS/EL2634806/310
This certificate is only valid with a legitimate ethics protocol number and signed by the Researcher (below)

Project title	Implications of the just energy transition for employees in the South African coal mining sector
Investigator / Researcher	Mrs Zukiswa Njokwana
Nature of Project	MM (Energy Leadership)
Decision of the Committee	Approved, provided stakeholders and participants are guaranteed anonymity and confidentiality.
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

31/10/2023
Date: