Investigating the impact of the Just Energy Transition (JET) on employment in South Africa.

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DECLARATION

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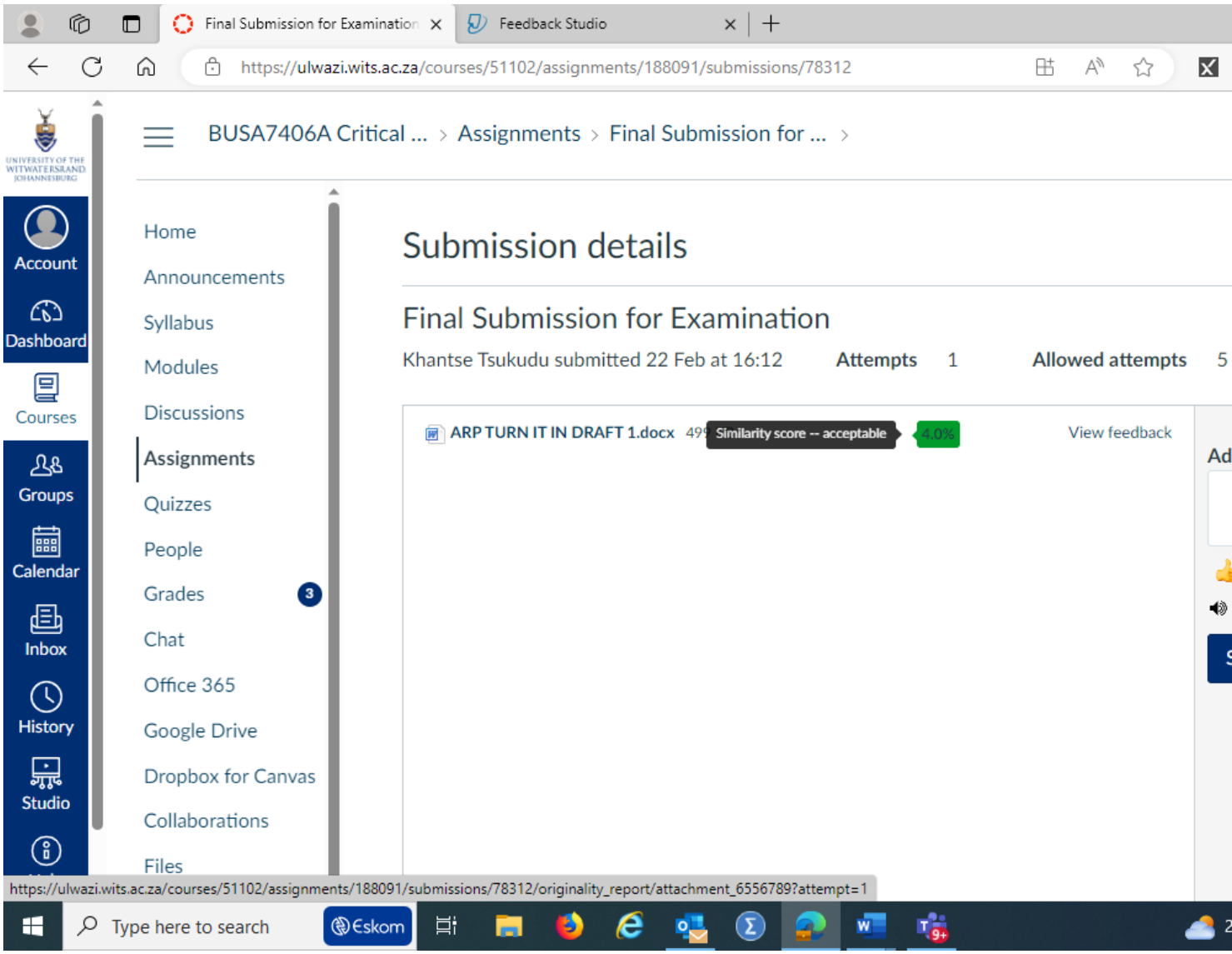
ABSTRACT

South Africa is a top greenhouse gas (GHG) emitter due to its substantial usage of coal to generate power. A "just energy transition" (JET) addresses climate change and greenhouse gas emissions in a fair, inclusive, and socially equitable way. Since Eskom generates over 90% of South Africa's and SADC's electricity from coal-fired plants, it will be used as a case study for how switching to renewables can impact employment. The feasibility of implementing JET at this current juncture will also be explored. By using a qualitative method approach, this study will generate evidence on the views of the various stakeholders within ESKOM that have been impacted by the transition and those that are yet to be impacted. These include employees currently employed in two ESKOM's power stations i.e., Komati power station, which was decommissioned in 2022 and Grootvlei power station which is set to be commissioned before 2027.

Keywords: *just energy transition, social inclusion, energy mix, carbon locked in.*

The nominated journal for the is research is the Energy Policy.

TURN IT IN SCORE FOR CONTENT (excl. table of content, list of tables and figures, declaration, references):



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LIST OF ABBREVIATIONS

Table 1: Abbreviations

Abbreviation	Name
AMCU	Association of Mineworkers and Construction Union
ANC	African National Congress
ARDL	Autoregressive Distributed Lag
CIT	Critical Incident Technique
CO_2	Carbon Dioxide
CEM	Coordinated Market Economies and
COSATU	Congress of South African Trade Unions
DMRE	Department of Mineral Resources and Energy
FEDUSA	Federation of Union South Africa
JEFT	Just Energy Transition Framework
GHG	Green House Gases
JET	Just Energy Transition
JETP	Just Energy Transition Partnership
LEM	Liberal Economy Markets
MLP	Multi-Level Perspective
NDP	National Development Plan
NUM	National Union of Mineworkers
NUMSA	National Union of Metalworkers of South Africa
NACTU,	National Council of Trade Unions
SACP	South African Communist Party
SARETEC	South African Renewable Energy Technology Centre
SAFTU	South African Federation of Trade Unions
REI4P/REIPPP	Renewable Energy Independent Power Producer Programme
RES	Renewable Energy Systems
SDG	Sustainable Developmental Goals
SADC	South African Development Community's

CHAPTER 1. INTRODUCTION

1.1 Statement of purpose

The purpose of the study is to investigate the impact of Just Energy Transition (JET) on the employment outlook in South Africa.

1.2 Background of the study

The current climate crisis poses a significant challenge to humanity with millions of individuals, particularly those residing in the Global South, experiencing its adverse effects (Hirsch, Matthess, & Funfgelt, 2017). Human activities have been the major cause of climate change due to fossil fuels usage. When fossil fuels are burnt, they release a greenhouse gas (GHG) into the atmosphere which causes climate change and its impacts such as heatwaves, disruptions to the ecosystem, adverse effects on human health and wellbeing amongst others. Fossil fuels continue to account for a large portion of South Africa's installed capacity for both primary and secondary energy supply (Field, 2021). The energy sector is a significant contributor to economic development by serving as a crucial component of the economy that generates employment opportunities and adds value through the extraction, conversion, and distribution of commodities and services across various industries (Department-of-Energy, 2018). There is growing consensus around the world that coal is a major contributor to the carbon emissions that are hastening climate change, necessitating a transition to cleaner energy sources (Cock, 2019). Therefore, there is no doubt that the country's energy regime must change despite the heavy reliance of coal for economic activity. ESKOM, a state-owned electricity provider in South Africa, relies on its coal fired plants to generate over 90% of South Africa's and the South African Development Community's (SADC's) electricity (ESKOM, 2023). The heavy reliance on coal to produce electricity positions South Africa as one of the world's highest emitters of greenhouse gases (GHG) such as carbon dioxide. About 60% of these emissions are from electricity generation, 15% from the construction and manufacturing sector, while transportation and other energy subsectors contribute about 12% each (USAID, 2016). In addition, they constitute a significant contributor to

atmospheric contamination, resulting in no less than five million untimely fatalities annually (Ritchie, Roser, & Rosado, 2022).

Following the dissolution of apartheid, an increasing number of individuals are now able to assert their rights to previously inaccessible services. In 1996, the percentage of people with access to electricity was merely 58%, with only one in four black households having such access, highlighting a stark racial disparity (Field, 2021). Field further suggests that by 2016, the proportion of households with access to electricity had risen to 88% (Field, 2021). As a response to increase environmental protection and investment in promotion of clean technology, trade unions in the United States of America (USA) in the 1980s and 1990s gave birth to the idea of a "Just Transition" as a reaction to increased environmental protection and investment in promotion of clean technology, both of which disproportionately impacted communities and workers of colour and those with low incomes (Dalit, 2023). It was an effort designed to ensure the assistance of workers who would lose their jobs as a result of environmental protection laws and the associated transition to cleaner energy sources (Kaggwa & Sithole, 2019).

The concept of JET has gained ground and is used across the world to define this mammoth task that can best be compared to the 4th Industrial Revolution (4IR). The significance of a just energy transition in the context of the 4IR stems from the similarities observed between the impacts of the revolution on workers and their communities, and those that will arise during the transition to clean energy (Kaggwa & Sithole, 2019). Like the Industrial Revolutions, the shift to JET is going to redefine all aspects of human endeavour with severe implications on the economy especially the jobs market. South Africa's shift towards clean energy takes place at a time where there are significant economic disparities, and this can be seen by in the number of South Africans who are unemployed. Data from Statista (2021) indicate that unemployment in South Africa has been increasing, reaching around 34% of those who are actively looking for jobs (Statista, 2021). South Africa's inability to grow an inclusive economy raises questions about the JET, whether the new innovations will improve the performance of the economy, or will it result in the further alienation of those who still seek to enter the economic mainstream.

As such, this study attempts to investigate and document the implications of the JET on employment, particularly when it comes to the creation and retention of the much-needed

jobs in South Africa. The study also aims to explore the feasibility of implementing the JET in response to the set environmental sustainability targets.

1.3 Research problem

Although the transition to a low-carbon economy has started, there is still limited understanding of how this transition will impact the employment outlook in South Africa. Currently, academic literature reflects on the long term benefits of transitioning from coal to renewables (Khobai, Kolisi, Moyo, Anyikwa, & Dingela, 2017) and the jobs that will be created as result of shifting away from fossil fuel usage (Müller & Claar, 2021). Furthermore, the government's principal climate change strategy of 2011 delineates its aspiration for a protracted shift towards a society and economy that is both resilient to climate change and characterized by reduced carbon emissions (Hirsch, Matthess, & Funfgelt, 2017). Given the socio-economic impact of the transition, it is necessary that further studies are undertaken to inform the policy choices in South Africa. Doing so, will also ensure that policy choices take into consideration the social and economic factors especially implications on the vulnerable groups who are most affected by rising inequalities.

The JET framework developed by the CSIS and CIF (2021) and the Social Justice Theories focusing on the recognitional, distribution and procedural aspects form a basis for this study as they focus on the promotion of economic growth while managing decarbonization in energy sectors in a way that is acceptable to society and causes minimal disruption (DMRE, 2021). The frameworks demonstrate how activities in two crucial areas—social inclusion and distributional impacts—are necessary to realize this goal (CSIS & CIF, 2021). The frameworks will be used to analyse the economic environment in South Africa with a view to establish the correlation between JET and the endeavours to grow the economy and create jobs.

1.4 Research Questions

This research is structured around the following questions:

- What impact will the JET have on the current employment climate in South Africa?

- How feasible is the implementation of JET within the South African context.

1.5 Research objective

Although long term benefits of transitioning to low carbon economies have been documented, the primary objective for this study is to investigate the impact of just energy transition on the immediate employment climate in South Africa. The study will also evaluate the feasibility of implementing JET currently within South Africa.

1.6 Rationale

Given the fact that JET is already contested by various political and social actors, it is important that more evidence of its impact be generated, and sound policies be put in place (Hermanus & Montmasson-Clair, 2021). The study aims to contribute to the limited body of knowledge by evaluating the potential negative and positive consequences of the transition, with the objective of assisting stakeholders and policymakers to develop policies that can mitigate the adverse impacts of the transition while enhancing the beneficial outcomes. It will also assist in avoidance of policy choices that will exacerbate the current unemployment challenges and lead to the repeat of some of the past mistakes. Social justice must be taken into account when moving towards sustainability. Recognitional, procedural and distributive elements must be considered before, during, and after the transformation phase in decision-making processes that direct just transitions (Bennett, Blythe, Cisneros-Montemayor, Singh, & Sumaila, 2019). By using a qualitative method approach, this study will generate evidence on the views of the various stakeholders within ESKOM that have been impacted by the transition and those that are yet to be impacted. The growth of renewable energy is seen as a key strategy for achieving sustainable development objectives since it has the potential to replace the highly polluted, dangerous, grey economy with a clean, healthy, green economy (Wang & Lo, 2021).

1.7 Delimitations of the study

The just transition is intrinsically linked to economic transition. The actual processes and technologies that will be implemented for the repurposing of the existing ESKOM coal

fired power stations to achieve low carbon emissions and the closure of coal mines will not be explored and thus will be excluded for this study. The demand-supply aspect of renewable energy is not included in the research due to time limitation. The study will only focus on the feasibility of the transition as well as the effect that the energy transition will have on employment.

While the focus of the study affects all South Africans, especially those in the coal value chain depicted in figure 1 below, owing to limited time and scope, the study will be confined to employees within ESKOM which is the country's largest electricity producer of which over 90% is derived from coal.

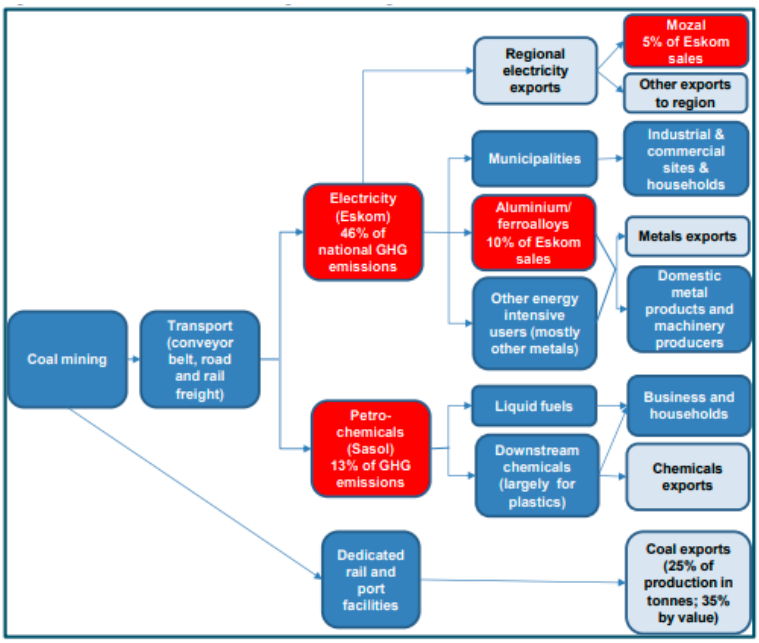

Figure 1:Coal Value Chain in South Africa (Makgetla, 2021)

1.8 Definition of terms

Distributional Impact

Focuses on the effects of the transition on social groups such as employees in particular industries whose jobs may be at risk. South Africa does not particularly have a good record when it comes to job creation, with the country

having one of the highest unemployment rates, and transitions such as these can disrupt and further exacerbate the socio-economic challenges.

Energy mix

a combination of various sources including coal, gas, solar, wind, biomass, and hydro. In the long term, the adoption of renewable energy sources (RES) has the potential to create employment opportunities within the energy sector. This shift may serve as a partial replacement for the reduction in coal-related jobs in regions that are impacted by this transition (Khobai, Kolisi, Moyo, Anyikwa, & Dingela, 2017).

Just transition:

The planned replacement of what has been termed dirty energy that emits GHG with newer cleaner energy sources such as renewable sources like wind, solar or hydro. The crux of just transitions is that while promoting the creation of green jobs it should in conjunction support growth of economies. South Africa as one of the highest emitters of GHG needs to urgently decrease its carbon footprint to increase its international competitiveness.

Social Inclusion

Refers to the inclusion of different stakeholders in the decision-making processes related to the just transition. This will afford excluded and vulnerable communities' opportunities to question and eliminate unfair power relations in this type of comprehensive approach (CSIS & CIF, 2021).

1.9 Assumptions

The study moves from a premise that all societal stakeholders are concerned about the future even if they have not been part of the ongoing discussions within and outside South Africa regarding the transition. A majority of the current energy challenges in South Africa manifest in ESKOM's inability to meet the energy demands and has thus created a situation where many South Africans are interested in discussions around energy broadly and the uptake of new technologies in particular. These include those who may

not have heard or used concepts such as the Just Transition. Given how these actors are engaged, it is possible that they will add their own views in such a way that it will enhance the quality of evidence as the discussions will not be limited to the elite. Importantly, it is assumed that every participant will be informed by their own experience relative to the questions being asked.

1.10 Chapter Outline

The study's remaining sections are structured as follows: The review of the empirical literature is covered in the next section. The study's research methodology will then be presented followed by a discussion of the results. An analysis and recommendations will then be brought in to conclude the study.

CHAPTER 2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

A "just transition" is a process that moves a country toward a more sustainable and equitable economy without excluding individuals who may be negatively affected by the changes (Hägele, Iacobuţă, & Top, 2022). A just energy transition is thus the transformation to cleaner energy sources without jeopardising crucial sustainable developmental goals. The idea of a "just energy transition" emerges at the intersection of energy transitions and socio-economic concerns (García-García, Carpintero, & Buendía, 2020), such as employment. Energy transitions are the changes that occur when one type of energy is replaced by another, such as when fossil fuels are replaced by renewables like wind and solar power. Employment on the other hand includes all people of working age who are either in a paid employment or self employed (ILOSTAT, n.d.). The relationship between energy transitions and employment can therefore be complicated and nuanced. The research contributes to an increased awareness of the employment challenges that may arise and must be addressed in South Africa for a 'just' energy transition.

The definition of just energy transition differs based on the situation and amount of desire. Heffron & McCauley (2018) argue that there is too much misinterpretation of what "justice" and "transition" represent, and that they should all be understood in the context of the just transition notion (Hefforn & McCauley , 2018). Too much emphasis has been placed on achieving the set climate change goals without considering the justice element of it, which is a crucial component in transitions. The South African government has pledged to decarbonize its economy and power sector by being a signatory to both the Paris Climate Agreement and the Sustainable Developmental Goals (SDG) frameworks (Hermanus & Montmasson-Clair, 2021) but there is no clear direction on how the current socio-economic climate of the country will be impacted and mitigation strategies thereof. SDG 7 states that everyone should have access to energy that is cheap, stable, sustainable, and modern (UN, 2017). When transitions are implemented, there are unavoidable social repercussions which can be both favourable and unfavourable to an economy. In this

context, a question is embedded on how *just* a just transition is and whether it will deliver positive *just* outcomes for society, as well as the material consequences. Although the causes and effects of just energy transitions can be complex, intertwined, and multifaceted, for purpose of this research, the focus will be on JETs impact on employment and whether or not it is feasible within the South African context. To achieve environmental justice in just energy transitions, it is important to involve impacted communities in the decision-making process, and to ensure that their voices are heard, and their concerns are addressed. This can be done through community engagement, public consultations, and the creation of forums for dialogue and collaboration.

2.2 Common factors impacting transitions globally.

2.2.1 Global Climate Targets and Environmental Justice

South Africa's dedication to phase out coal was made possible by its adherence to the Paris Agreement (SA-News, 2016). Environmental justice in just energy transitions requires a holistic approach that considers both the environmental and social impacts of transitioning to a more sustainable and clean energy system, and that seeks to create a more equitable and just energy future for all. Developed countries that have long been industrialised have mainly contributed to today's effects of climate change, yet the emerging economies such as South Africa less culpable for these effects (Wood & Baker, 2020), will be hit hardest in terms of loss of income, property, and safety and will suffer the damage.

2.2.2 Carbon locked-in phenomenon.

The carbon lock-in phenomenon refers to the resistance to pursue renewable energy sources due to a reliance of fossil fuels for huge energy systems (Janipour, de Nooij, Scholten, Huijbregts, & de Coninck, 2020). Studies conducted by Rentier, Lelieveldt and Kramer (2019) between 1990 and 2017 compared the complexities between carbon locked-in Coordinated Market Economies (CEM) and Liberal Economy Markets (LEM) with regards to the phasing out the use of coal to meet the environmental targets. They argued that in LEMs the private sector often owns the electrical grid, and governments typically let market parties determine which electricity provider offers the best rates

(Rentier, Lelieveldt, & Kramer, 2019). In contrast, South Africa's energy market is regulated by the government. Systemic job protection, government ownership, and the fact that consensus processes let major stakeholders obstruct or resist political choices make it hard to quickly phase out energy sources that are carbon intensive. The authors findings conclude that substantial compensations and side payments may be necessary to offset the impact of job losses and may necessitate the writing off sunk assets in CEMs (Rentier, Lelieveldt, & Kramer, 2019).

Energy intensity indicates a country's energy efficiency relative to its economic production (Goldemberg, 2020). A high energy intensity score indicates the energy demand in an economy is high and this suggests inefficiency in energy usage (Azaliah, Kurniawan, Hartono, & Widyastaman, 2023). Herzer (2024) posits that decreasing energy intensity in developing countries allows them to improve their living standards without a corresponding rise in energy consumption, thus mitigating environmental issues linked to growing energy demand like pollution and climate change (Herzer, 2024). According to Khobai et al. (2017), the energy intensity of South Africa's economy is higher than the average, implying that a significant amount of energy is needed to generate one unit of gross domestic product (Khobai, Kolisi, Moyo, Anyikwa, & Dingela, 2017). This is attribute this to the fact that coal, which is cheap and readily available, is heavily utilized as a source of energy in South Africa. Khobai & Le Roux's (2017) study was focused on South Africa and the interplay between the country's energy use, carbon dioxide emissions, GDP growth, trade openness, and urbanization (Khobai & Le Roux, 2017). The findings from their study indicated that growth in South Africa could be slowed by policies that attempt to reduce energy use and control for CO_2 emissions. This implies that the potential negative effects in economic growth should be taken into consideration when implementing renewable energy sources (RES) in South Africa.

2.2.3 Policy development, social dialogue and decision-making processes.

Active involvement of stakeholders, such as labourers, local communities, and civil society groups, is crucial during the transition phase to guarantee that their perspectives are acknowledged, and their concerns are addressed. Association of Mineworkers and Construction Union **(AMCU)** has been vocal about the need for a working-class led JET for the past five years, and the union remains steadfast in its belief that climate change

must be addressed in the context of South Africa's realities of tremendous inequality, huge unemployment, and underdevelopment (Bulbulia, 2022). National Union of Mineworkers (NUM) made clear that unions did not oppose the goal of a low-carbon, climate-resilient economy for the country, but they did have concerns about the concept's definition and the planned road to get there (Bulbulia, 2022a). This highlights that hesitance to fully embrace the JET are fears of job and livelihood loss, particularly in the energy and coal mining sector. Mertins and Deshpande (2019) carried out a study in Canada to analyse the coal transition policies and the impact they have on workers in the coal industries. Their findings revealed that the transition policies overlook the current social and economic imbalances, which may be further exacerbated by the transition (Mertins-Kirkwood & Deshpande, 2019). They further state that future zero-carbon economies may be just as unfair and unjust as today's fossil fuel-based economies if the relative marginalization of different types of workers in the sector are not acknowledged and solved. Labour unions in South Africa have already raised concerns that introducing alternative energy sources will serve to enrich the owners of the private enterprises and affluent workers/individuals at the expense of the country (Mvumvu, 2019).

2.2.4 Employment outlook

Areas dependent on coal, like Mpumalanga, may experience a worsening of unemployment and poverty as a result of the shift away from coal, according to Annecke and Volpe (2022) when they conducted studies on evaluating how existing policies meant to promote people's well-being may be redirected to promote social justice and a smoother transition to a more equal society (Annecke & Wolpe, 2022). Although more jobs will be created as the economy diversifies, particularly in the area of renewable energy, this may not include positions for miners or people already working in the formal or informal coal value chain.

ESKOM, as of 31 March 2022, had a staff compliment of 44 772 employed at its Generation, Transmission and Distribution divisions (ESKOM, 2023). In addition to announcing its own net-zero 2050 target, ESKOM also formed a Just Energy Transition Office in 2020 (ESKOM, 2022). Even though ESKOM is a state-owned company, its choices have far-reaching effects on the private coal industry and the energy sector. There is a great concern for the labour force situated in the Mpumalanga area. ESKOM has

however stated that through partnerships funding has been secured to retrain and upskill employees and communities in these areas to ensure that the transition is as just as possible (ESKOM, 2022). ESKOM is thus crucial in leading and reorienting South Africa towards cleaner energy over time in a fair and equitable way (SA-News, 2022b). ESKOM has highlighted that renewables have potential to create direct, indirect, and induced jobs from solar and wind related construction.

Studies on the impact of renewable energy consumption on unemployment conducted by Khobai et al. (2017) using the Autoregressive Distributed Lag (ARDL) Model with their primary goal being to identify both the immediate and long-term consequences. Their findings show that using renewable energy sources has a negative and statistically significant influence on long-term joblessness. Short-term, however, the connection between the factors is weak (Khobai, Kolisi, Moyo, Anyikwa, & Dingela, 2017). These findings can however be challenged in that transitioning to renewables has a potential of creating employment opportunities in the manufacturing, agricultural, maintenance of renewable energy units. ESKOM has alluded to building microgrid manufacturing plants and retraining and reskilling employees to be employable in other sectors of the economy (ESKOM, 2022). The renewable energy sources would need to be maintained and this will contribute to net positive job creation in the long run.

Potential job losses due to the transition will further exacerbate the challenge that the state is facing with regards to many inhabitants living below the poverty line. It has been reported by StatSA in 2019 that 1 in every 5 (about 18 million) of South African relies on social grants, relief assistance or social relief (Statista, 2022). This puts additional burden on the state which has set aside R66 billion for social development for the next few years (National-Treasury, 2023). Annecke and Wolpes (2022) emphasise that the current unemployment benefits and social grants will not cover the demands of individuals who lose their wages, thus it is vital that we figure out how to reskill and how to deliver jobs or offer enough social security for retrenched miners and others (Annecke & Wolpe, 2022). Jobs and income from coal deployment have reliance on other factors that must be considered for a just transition to occur. Although an increase in RES may generate employment in the energy sector, this will only partially substitute the decline in coal related jobs. South Africa has the highest GINI coefficient in the world with an unemployment rate of 33% (Mukherjee, 2023), making the issue of potential job losses

due to the transition a very sensitive topic both socially and politically (Hanto, et al., 2021). Potential negative effects on economic growth should also be considered while implementing energy conservation measures (Khobai & Le Roux, 2017). Economic expansion and quality of life have both been stunted by the persistently high unemployment rate.

The Just Energy Transition Partnership (JETP) between South Africa, Germany, France, United Kingdom, and the European Union have developed financial options for the early retirement of coal fired stations (Houston & Ruppel, 2022). Community development grants and job retraining programs with an emphasis on just transitions are two types of assistance provided by JETP to various groups. (IEA, n.d) but it remains unclear on whether this funding mechanisms will be sufficient to mitigate the posed risk to jobs in the coal supply chain in the country. Compensation for the South African workforce that will be impacted may not be feasible as the fiscus is already heavily constrained. It has been widely agreed that the country will receive about $20bn, much more than the initial pledged $8.5bn by the JETP, to ensure a just transition (Hadley, Mustapha, Colenbrander, Miller, & Quevado, 2022).

2.3 ANALYTICAL FRAMEWORKS

2.3.1 Theoretical Framework

The idea of a "just energy transition" emerges at the intersection of energy transitions and socio-economic concerns (García-García, Carpintero, & Buendía, 2020), such as employment. The relationship between energy transitions and employment can therefore be complicated and nuanced.

2.3.1.1 Just Energy Transition Framework (JETF)

The Just Energy Transition framework is a widely adopted framework which emphasizes the importance of engaging workers and communities in decision-making processes and ensuring that they are not left behind in the transition to a low-carbon economy (Presidential Climate Commission, 2022). The Just Transition framework acknowledges that while shifting to a low-carbon economy may lead to increased employment and lower

carbon emissions overall, it may also cause economic disruption and the loss of jobs in industries heavily reliant on fossil fuels. The framework does not specifically address climate mitigation and adaptation initiatives. The framework prioritises addressing the social and economic impacts of policies, with a focus on integrating human development considerations into decision-making (Presidential Climate Commission, 2022).

To mitigate societal costs and realize the promise of good employment conditions, concerted, dialogue-based policymaking with the coal value chain workforce will be essential from the outset. Clarity by policy makers in the country needs to be provided on how the transition will affect employees in coal dependent industry and whether the transition will alleviate the socio-economic challenges the country currently faces. Political leaders in South Africa can address both the climate issue and the economic crisis by enacting a truly equitable transition to a green sustainable economy that protects workers and creates decent jobs for all.

2.3.1.2 Energy Justice Three Tenant Theory

The energy justice theory complements and expands on the Just Energy Transition Framework (JETF) in that they provide an integrated and holistic approach for the advancement of just energy transitions. Literature that was focused on was in respect to carbon dependent countries where coal accounts for a vast majority of their economic activities and has plays a significant role in the GDP and the themes to be discussed below were most prevalent.

Sovacool and Dworkin (2015) and Jenkins et al. (2016) conceptualized energy justice and fair transition by elucidating the three tenets of justice, namely distributional, recognitional, and procedural (Sovacool, Baker , Martiskainen, & Hook, 2019). During transitions, the focus should not only be on climate change but also on the justice dimension. South Africa may work towards a just and sustainable transition by incorporating these theories of justice into the planning and implementation of the just energy transition. This will maximise the advantages of renewable energy while minimising negative effects on employment and ensuring social equity. Through **recognitional justice**, all existing interest groups and rights holders in each area that will be affected by the transition need to be identified (Bennett, Blythe, Cisneros-Montemayor, Singh, & Sumaila, 2019). South Africa is the world's sixth largest steam

coal exporting country (International Energy Agency, 2019a), and the country's economic revenue and employment structure are heavily reliant on coal mining and commerce. Coal is certainly crucial to our economy, as evidenced by the 2500 mines in operation, 6000 mines without owners or abandoned, and 1500 coal trucks delivering coal to ESKOM daily (Cock, 2019). With around 92 000 direct jobs and 170 000 indirect jobs, the coal industry in South Africa continues to be the country's largest energy employer (Cock, 2019). **Procedural justice** takes into consideration the involvement of all parties that will be affected by the transition. The parties include, but are not limited to, trade unions and non-unionised workers, businesses in the energy sector, political leaders, local governments, civil society, energy consumers and the general public. ESKOM through its stakeholder and change management initiatives has established dialogue with workers to be impacted by the transition (ESKOM, 2022) through decision-making participation and inclusion, as well as the quality of governance processes (Bennett, Blythe, Cisneros-Montemayor, Singh, & Sumaila, 2019). Such processes should be inclusive and transparent. (CSIS & CIF, 2021). This will be monitored by evaluating the knowledge that affected parties have on the transition. The research will establish the extent at which the affected employees have been engaged. **Distributive justice** is concerned with how opportunities, rewards, and resources are shared fairly in society. By assuring the absorption and retraining of existing personnel, ESKOM might play an essential role in easing South Africa's transition away from coal. The CSIS &CIF posits that distributive justice necessitates that the gains and liabilities connected with change processes be equitably distributed among individuals and groups (CSIS & CIF, 2021). Axon & Morissey define distributive justice as ensuring that expenses, risks, and benefits are fairly shared among various parties (Axon & Morissey, 2020). The main concern is about how the costs and benefits of the shift are allocated among various affected groups in South Africa and how they will adequately measure the energy transition's effect on employment. A significant number of firms of European origins were successful bidders in the first round of the Renewable Energy Independent Power Producer Programme (REIPPP), due to the stringent requirements and pricing structure which most South African bidders did not meet or could compete with respectively (Müller & Claar, 2021). The government however to ensure inclusivity, successful bidders were expected to meet both local content and socioeconomic standards by providing evidence of substantial local ownership (Müller & Claar, 2021). Positive employment growth and increase in the country’s GDP will be possible if the transition is managed efficiently and effectively. To

achieve this, the JET policies should develop mitigating actions against the negative consequences that fossil fuel value chain workers may be faced with. It is imperative that relevant skill sets, especially for young people, in line with upcoming employment opportunities are identified (DMRE, 2021). Skills training, assistance with career changes, and social protection programs for workers and marginalized communities are all necessary (CSIS & CIF, 2021).

From the above theoretical frameworks, linkages can be made in that they consider the socio-economic elements of transitions. The overarching aim of these identified theoretical frameworks is to develop a sustainable and inclusive energy system that benefits all members of society, all while addressing the urgent need to cut GHG and mitigate the impacts of climate change. The above frameworks, however, fail to effectively explain the "how" of implementation of transition and solely focus on policy making. While the term *just* has different meaning depending on context, a common theme around reviewed articles is the unpacking of the word as many scholars are concerned with the social implications that the transitions will have and whether policies that are drawn up extend to cover the potential challenges that may arise due to these transitions.

2.3.2 Conceptual Framework

To ensure that the transition to a low-carbon economy is equitable and just, the Just Transition framework calls for a range of policies and practices that prioritize the needs of workers and communities affected by the transition. The creation of new jobs does not always reflect fair transitions, much more important are factors like job diversity, job stability, and longevity, as well as community adaptability and creativity in the face of volatile energy markets (Harrahill & Douglas, 2019). The proposed conceptual framework builds on the Just Transition Feasibility Framework (JTFF) developed by Mirzania et al. (2023) which evaluates the interplay between feasibility limitations and energy justice. (Mirzania, Gordon, Balta-Ozkan, Sayan, & Marais, 2023). The framework is built on the energy justice tenets (distribution, procedural and recognitional) as well as the assessment of the constraints within the techno-economic, socio-political and socio-technical perspectives. The authors describe the feasibility limitations, amongst others, as significant reliance on coal, resulting in high levels of carbon dioxide emissions,

inadequate climate legislation, and a lack of awareness regarding climate issues (Mirzania, Gordon, Balta-Ozkan, Sayan, & Marais, 2023). Their study was based on actors who are primarily involved in the renewable energy aspect of the transition, rather than the coal phase-out. This framework will be used to assess its viability to workers in the coal industry transitioning to renewable energy sources.

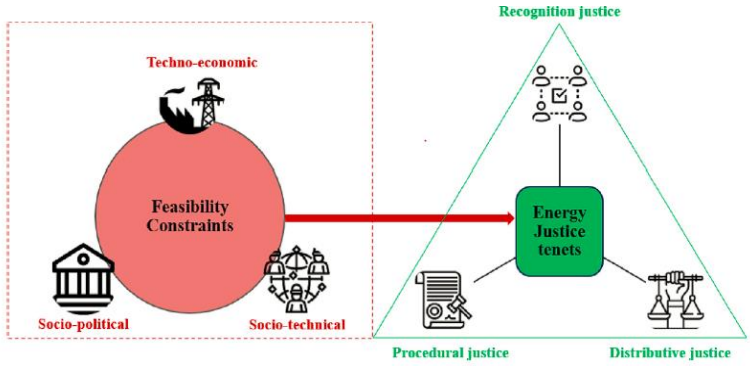

Figure 2: Just Transition Feasibility Framework **(Mirzania, Gordon, Balta-Ozkan, Sayan, & Marais, 2023)**.

2.3.2.1 Techno-economic

Transition to more advanced and environmentally friendly energy systems, such as renewable electricity sources, typically necessitates substantial changes not only in technology, but also in political rules, tariffs and pricing structures, and the behaviour of users and adopters (Sovacool B. K., 2016). Hanto et al. (2021) report that there already has been a decline in employment since the 1980's due to automation and mechanisation in the mining sector (Hanto, et al., 2021). This means that coal mining jobs are already in danger and will be exacerbated by the transition. While RES have the potential to create employment in South Africa (Khobai & Le Roux, 2017), it is necessary to assess whether the employment opportunities will be suitable as alternative jobs go hand in hand with skills, mostly which cannot be transferred. In order to mitigate the job losses in the province of Mpumalanga which houses a majority of the coal plants and coal fired power stations, focus should be placed on economic diversification i.e., creating opportunities in alternative sectors such as transport, manufacturing, and agriculture (Hanto, et al., 2021). A vital move in South Africa's move to sustainable energy is the R9 billion concessional loan approved for the conversion of the Komati Power Station which will enable ESKOM to retrain employees and members of host communities to empower them (SA-NEWS, 2022a).

2.3.2.2 Socio-political

Fairness, equity, inclusion, and participation are all values that should inform a just energy transition so that vulnerable communities and workers are not negatively impacted. There needs to be a balance between the need to reduce carbon emissions and the concerns of affected people, and policies need to be established to find that balance. Entrenched interests will try to fight these sorts of reforms, it is therefore necessary to alter existing policies, which in turn will necessitate political manoeuvring and power conflicts (Geels, 2011). ESKOM's long-term ambitions include working with the government, industry, academia, and civil society to advance a JET agenda (ESKOM, 2022). A crucial metric for assessing the societal ramifications of equitable energy transitions is the quantity of employment opportunities generated within the renewable energy field and its associated sectors. This encompasses both primary employment opportunities, such as the implementation and upkeeping of sustainable energy systems, as well as secondary employment opportunities, such as those within the production and distribution networks. Because there is no evidence-based rationale for comparing coal mining employment to renewable energy employment, job creation in other non-energy priority economic sectors (such as manufacturing, waste management, tourism, or agriculture) may be more advantageous in coal-dependent regions than renewable energy employment (Hermanus & Montmasson-Clair, 2021). Unions in South Africa advocate that for the transition to be just, retraining, and financial support for people in industries which will be impacted is imperative and that any new employment created in the transition should have opportunities. It will take time for communities and workers who depend on fossil fuels to find alternate sources of income and funding in South Africa. This is why transitioning involves more than just phasing out polluting businesses; it also involves the creation of new jobs, industries, skills, investments, and opportunities for a more equitable and resilient economy.

2.3.2.3 Socio-technical

The idea of socio-technical transition emphasises the co-evolution of technology and its interaction with society across several spheres (Batinge, Musango, & Brent, 2019). The accessibility of necessary training and skill-development opportunities is a key mediating factor in the employment impact of simple energy transitions. Creating jobs and enhancing people's skills as new ventures are launched that will benefit different sectors

of the South African economy have been identified by the government. A smoother employment transition and fewer possible job losses can be achieved by providing people in traditional fossil fuel businesses with the skills they need to shift to the renewable energy sector. Additionally, the value chain for renewable energy would experience considerable manufacturing activity, creating more job possibilities for the nation. ESKOM through its Just Energy Transition strategy posits that the affected employees will be retrained and reskilled to be employable in other sectors of the economy such as manufacturing, agriculture, and construction (ESKOM, 2022). The quality of jobs created through just energy transitions, including factors such as wages, benefits and job security should be considered. Upscaling manufacturing in the country by manufacturing the wind turbines and solar panels in the country could mitigate the potential unemployment. These efforts, however, cannot replace growth-enhancing structural reforms in tackling the country's major economic and development concerns.

2.4 Conclusion of Literature Review

Long-term employment trends are encouraging, but that is of little to no comfort to those whose livelihoods are currently dependent on the energy resource. South Africa firstly needs to address its severe developmental concerns of poverty, unemployment, and inequality and must discover ways to "separate" the economy from the environment (NPC, 2016). Sovacool et al. (2019) state that it is possible that the current wave of low-carbon transitions would "produce new injustices and vulnerabilities while failing to address pre-existing structural drivers of injustice in energy markets and the larger socio-economic system" (Sovacool, Baker , Martiskainen, & Hook, 2019). The process of helping workers and communities receive a fair deal as the country moves from fossil fuels to clean energy requires interaction between multiple stakeholders that are not used to working together. Therefore, the research objectives suggests that there must be more acknowledgement in the just transition rhetoric of the correlation between successful decarbonization and rising job losses for individuals in the coal sector (Bosca & Gillespie, 2018). It is crucial to broaden the current low-carbon transition discourse beyond its current technological concentration and to encourage more participation in concerns of social justice (Sovacool, Martikainen, Hook, & Bake, 2019).

CHAPTER 3. RESEARCH METHODOLOGY

3.1 Introduction

The pressure of meeting climate goals and the economic impact is proving to be more complex than an anticipated phenomenon. This study aims to investigate and document how the Just Energy Transition (JET) will impact the employment climate in South Africa and the feasibility of implementing the transition thereof. The concept of a just energy transition means ensuring that fairness and equality are at the heart of any changes in how we produce and use energy. The goal is to ensure that as we move towards new ways of getting energy, we don't create new problems or make existing problems worse for certain groups of people-especially those currently employed in the coal value chain.

This chapter will outline the methodology used to conduct the study. It will include the general framework for conducting research, including the theoretical viewpoint, research design, the target audience, strategies for gathering data, how the data will be collected, where the data will be collected, methods for analysing that data, and methods for interpreting findings. The ethical considerations will then conclude the chapter.

3.2 Research approach

Given that this research is exploratory in that the impact of the just energy transition on employment in South Africa is being examined, a qualitative research approach will be employed. Creswell and Creswell (2018) describe the qualitative research approach as a method for investigating and comprehending the meaning that individuals or groups assign to a social or human situation (Creswell & Creswell, 2018). A qualitative research approach is appropriate for this study as it will enhance the comprehension of the impact of transitioning to cleaner sources of energy employment being investigated by providing clarification and an in-depth of understanding through responses from participants that will be affected by the transition. This approach will capture the nuances and complexity of the transition and encompass the lived experiences and viewpoints of individuals who

have been affected and/or impacted by the transition. The key assumptions of a qualitative research approach would be that:

- There is no one single or "correct" answer to the question of how energy transitions impact employment in South Africa and whether or not is feasible to implement within the South Africa context.
- Multiple perspectives and experiences will be considered to gain a full understanding of the transition.
- Context is important, and the impacts of energy transitions on employment will vary across different countries and economic contexts.

The above assumptions align with the purpose of the study in that they will assist gain a comprehensive and nuanced understanding of the impact of just energy transitions on employment in South Africa. They also analyse the role of context, which is critical in any study of employment and economic development. These assumptions are ideally suited to this purpose because ESKOM, which will be used as a case study, is a complex entity with a variety of perspectives and experiences that need to be considered. Understanding an organization's experiences with energy transitions and their effects on employment will also require knowledge of the environment in which it operates. ESKOM understand the issue's complexity and the necessity to include diverse viewpoints and experiences. An interpretive approach will be embarked upon as is seeks to comprehend and clarify the social realm in its current state, through the perspective of individuals who are actively engaged in the social process (Gunbayi, 2020). The fundamental principle of interpretivism posits that individuals are consistently engaged in the process of interpreting their dynamic surroundings (Williamson, 2007).

3.3 Research design

According to Durrheim (2004), research design is a framework for strategic action that connects the execution of the research strategy and the research questions (Durrheim, 2004). A descriptive research method will be applied in this study. Descriptive research according to Atmowardoyo (2018) aims to provide the most precise description of the phenomena that already exist (Atmowardoyo, 2018). This type of strategy was also chosen as it focuses on understanding and interpreting people's natural experiences,

behaviours, and perceptions about the impact that transitioning from fossil fuels to alternative sources of energy will have on employment in South Africa. The advantages and disadvantages of the case study methods are tabulated below:

Table 2: Benefits and Challenges of the Case study method.

Advantages	Disadvantages
The main advantage is that it provides a unique opportunity to gain a deep understanding of the energy transition from the perspective of a company that is heavily reliant on fossil fuels. This perspective is likely to be very different from that of other companies or organizations, and it could provide valuable insights into the challenges and opportunities associated with the transition. Potential to yield significant revelations regarding the societal and cultural context of the energy shift, as well as its effects on labourers.	The results obtained may not be indicative of or applicable to a larger group. Separating personal biases from the data may be a challenge. The analysis process itself can be challenging and time-consuming. The case study may be seen as biased or skewed in the favour of ESKOM's perspective. To mitigate this, participants will be well informed of the goal and reach of the study, as well as the fact that their participation is voluntary and confidential.

3.4 Data collection methods

For qualitative research, the fundamental goal of sampling is to collect unique cases, events, or acts that can explain or improve the researcher's understanding of the phenomena under study (Ishak & Bakar, 2014). Given that the Critical Incident Technique (CIT) adaptability enables a wide range of data collection techniques (Bott & Tourish, 2016), the structured interviews questions will be designed as informed by the CIT. Flanagan in the nineteen fifties defined the CIT as follows: "To be critical, an incident must occur in a situation where the purpose or intent of the act seems fairly clear to the observer and where its consequences are sufficiently definite to leave little doubt concerning its effects" (Flanagan, 1954). The interviews will be used to gather information from the power station employees who have been impacted by the transition and those who will be impacted within the organisation.

3.5 Population and sample

3.5.1 Population

According to Hermanus and Montmasson-Clair's (2021) estimation, the present figure of individuals who are directly employed within the coal value chain is approximately 310,000 (Hermanus & Montmasson-Clair, 2021). Due to time constraints the research will be limited to 11 ESKOM employees.

3.5.2 Sample and sampling method

Purposive sampling will be adopted in this study. ESKOM, the South African electricity state owned utility, will serve as a useful case study for studies on how changes in energy use may affect employment for several reasons due to the following:

- It is the largest state-owned electrical producer in Africa (Lawrence, 2020), and is crucial to supplying South Africa with electricity. Being a large player in the energy industry, any shift or adjustments to its business practices may have a profound effect on employment and associated socioeconomic variables.
- ESKOM employs a sizable workforce in a variety of its divisions, including generation, transmission, and distribution. The difficulties of managing workforce changes, including potential job losses, retraining requirements, and chances for developing new employment in renewable energy sectors, can be revealed by researching the effect of just energy transitions on employment within the organisation.
- Understanding the employment impact of merely ESKOM's energy transformations can have policy repercussions for other nations and areas going through comparable transitions. Policymakers, energy firms, and labour organizations can benefit from the lessons learnt from the ESKOM case study when considering methods and interventions for managing employment transitions throughout the switch to sustainable energy sources.
- Considering equity and social justice, just energy transitions seek to ensure that the switch to greener energy sources is fair and advantageous to all parties involved, including the impacted communities and employees. Thus, questions of

social justice, fairness, and inclusivity in the energy transition process can be investigated by examining the effects of energy transitions on employment at ESKOM.

3.6 The research instrument.

For purposes of this study, semi-structured interviews will be used to collect data. Clearance has been issued by ESKOM to conduct the study. Semi-structured interviews consisting of 12 questions excluding the demographic questions will be conducted with a total of 11 employees ranging from semi-skilled to skilled.

A consent template form on Annexure 1 which will be signed by the respondents, outlines the purpose of the study, the participants' rights, and what will be done with the information they provide will also be furnished to the respondents for signature. The questionnaire is structured as follows:

- A brief description of the Just Energy Transitions concept forms the heading of the interview guide.
- **Part 1** of the interview guide consists of the demographic information to capture the profiles of respondents. Demographic information is crucial in that it can assist in gaining a deeper understanding of some characteristics of the selected participants as well as in seeking contrast responses, in this case those of coal power station employees and management.
- **Part 2** of interview guide is about perceptions opinions, points of view, and unique experiences in relation to the impact that the transition has had on them in response to the demand for a just energy transition in South Africa. These inquiries can aid in identifying potential worries or reservations regarding the energy transition as well as potential opportunities that might be present for employees who will be affected. The respondents' views of the feasibility of the transition will also be probed.
- **Part 3** of the interview guide focuses on possible job changes brought on by the energy transition. For anyone who might be impacted by the energy transition, these questions might help identify prospective career paths as well as potential training and support needs.

3.7 Procedure for data collection

Through their permission, a total of 11 employees will be requested to participate in the interview. The interviews will be done virtually through Microsoft Teams where a voice recorder and Microsoft Teams recorder and the transcriber tool will be used respectively to capture the responses verbatim. The interview will consist of 12 questions to gather their views from the 11 employees to gather insights on their perspectives about the just energy transition and its feasibility thereof. The questions will also capture whether the transition is implemented in a way that is both just and equitable.

3.8 Data analysis strategies and interpretation

A thematic data analysis technique will be employed, which entails establishing patterns or themes within the data collected (Ayre & McCaffery, 2022). Data familiarisation will be followed by generation of codes from which themes will be derived. These themes will be reviewed, defined and named.

Recorded interviews will be transcribed, populated, and organised together with the responses from the questionnaire on Microsoft Excel. The figure below briefly summarises the process to be adopted one data has been collected.

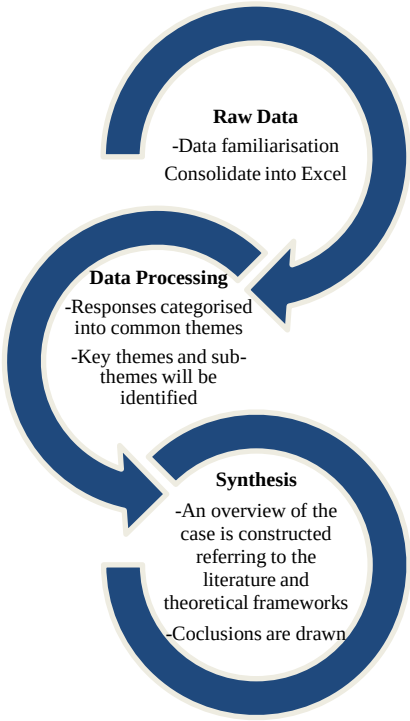

Figure 3: Data analysis steps

3.7.1. Raw data

- The responses of each respondent will be carefully reviewed by paying great attention to the breadth of the data to determine the respondent's opinion regarding the impact of JET on employment and its feasibility thereof.
- An analysis and examination of the responses will be conducted to identify if there are any recurring concepts or patterns that arise.
- After segmenting the data, patterns that indicate categories or themes as well as the sub-themes will be looked for. The information will be further analysed for qualities after categorization.

3.7.2. Data Processing

- Categories will then be developed from the recurring concepts to classify the data. These key words (codes) will then be used to come up with themes.
- The additional key words that may arise when data is examined and analysed will be used to supplement the main themes.

3.7.3. Synthesis

- The key words or themes will be compared to existing literature on the just energy transition impacts.

3.9 Possible limitations and challenges of the study

- The current number of individuals employed directly within the coal value chain is estimated to be approximately 310 000 (Hermanus & Montmasson-Clair, 2021). The limitation is that data will only be collected from limited number of participants i.e., ESKOM employees who may not be representative of the larger population i.e., total affected workforce in the coal value chain.
- Access or maintaining access to participants may be a challenge which may lead to insufficient data being collected.

3.10 Quality Assurance

3.10.1 Transferability

Transferability, according Nassaji (2020) refers to how well the researchers' interpretations or findings can be applied to other contexts that are comparable (Nassaji, 2020). Thick detailed description of the context and participants will be furnished and will provide more insight on the impact that transitioning to alternative energy sources will have on employment in South Africa.

3.10.2 Credibility

Triangulation method of data collection will be used in that data will be gathered from participants and linked with the reviewed literature to establish common themes with regards to JET imperative which is set to transform various domains of human activity, with significant ramifications for the economy, particularly the labour market.

3.10.3 Dependability

There has been a scarcity of qualitative research conducted, which has relied on primary data obtained from interviews with experts (Mirzania, Gordon, Balta-Ozkan, Sayan, & Marais, 2023).The process of gathering, analysing, and interpreting data can be impacted by prior information on the topic, which could compromise the objectivity and reliability of the results.

3.11 Ethical considerations

- An ethical clearance from ESKOM providing permission and security to conduct the research has been obtained and is attached as link on Annexure 3. The conditions stated on the clearance documents shall be strictly adhered to.
- All participants will be made aware of the research's aim and goals, and their consent will be requested to participate. To avoid power dynamics of participant's feeling pressured to answer in a certain way, participant will be informed that this is voluntary and will not be pressured to sign the consent forms. They may, at any time, withdraw participation.
- The research will not cause any reputational harm to ESKOM or cause any psychological harm to the participants.
- The information gathered will be kept private in a password secured device and will only be utilized for study reasons.
- Once the research is completed, debriefing interviews with the participants to gain their viewpoint on the research process will be conducted. This will assist in examining own prejudices and worldviews and in making sure that the research is conducted as ethically as feasible.

3.12 Proposed schedule and timelines

A detailed timeline plan is attached on annexure 4.

CHAPTER 4. RESULTS AND ANALYSIS

4.1 Introduction

Just energy transitions in developing countries presents difficulties such as the displacement of jobs in conventional energy industries and the necessity for retraining the workforce. The shift towards energy systems that are both decarbonised and efficient has significant socio-economic consequences (Füllemann, Moreau, Vielle, & Vuille, 2020). The timing of the just energy transition is crucial given the high dependence on coal to drive economic activity in South Africa.

This chapter provides an in-depth look at the insights that were gained from asking the respondents detailed questions during the interviews. A thorough analysis was done on the transcribed interview responses and was reviewed multiple times for data familiarisation. These insights were gathered using a thematic approach to data analysis. The 11 respondents were identified at two sites i.e. the decommissioned ESKOM's Komati power station and ESKOM's Grootvlei power station which is next in line to be decommissioned. To avoid bias, the interviews were conducted on a random representative group within ESKOM and the response rate was a 100%. The employees that were employed at Komati power stations have since been redeployed to other ESKOM power stations. Komati Power Station, situated in Middleburg, reached the end of its operating life on 31 October 2022, and a significant majority of the workforce were in accordance to operational demands, relocated from the Komati power station to provide support and enhance expertise in other power stations and business sectors within ESKOM (ESKOM, 2022a).

The interview responses are attached as a link on Annexure3. The data analysis begins with a brief summary of the participant's demographic background, which adds important context as one of the main objectives of the just energy transition is to ensure that the marginalised are not excluded.

4.2 Demographics of the respondents

This section delves into the respondents' demographic profile consisting of gender, race, age and position held in ESKOM. The respondents will be referred to as Respondent 1, Respondent 2, Respondent 3… etc to protect their identities. All interviews were conducted and recorded on Microsoft Teams.

4.2.1 Race, Gender and Age

Table 1 below depicts the , gender, age and race of the respondents.

Table 3: Demographic information of participants

Gender	Female	36%
	Male	64%
Age	21-25	36%
	26-55	64&
Race	Black	

The respondents' group were only black males and females accounting for a 100% of the interviewed respondents. It was important for this study to interview this group of respondents as they are classified as marginalised due to the socio-economic injustices (amongst others) of the previous government. The age of the respondents was also crucial to this study to determine whether the respondents would be able to adapt and be reskilled to the newer and cleaner technologies of energy generation.

4.2.2 Current position

Table 3 below illustrates the respondents current positions held by the respondents. The positions are important because it will help assess the if the JET concept has been shared/discussed with all impacted employees irrespective of the level of employment they are in.

Table 4: Current positions of respondents and department

Respondent	Position	Department
1	Operator	Operating
2	General Manager	Management
3	Operator	Operating
4	Controller	Commissioning
5	Manager	Operating
6	Senior Manager	Asset Management
7	Manager	Protection, Telecommunication and Metering
8	Engineer	Electrical Engineering
9	Supervisor	Electrical Maintenance
10	Technician	Protection, Telecommunication and Metering
11	Controller	Operating

4.3 Findings

The research objective is to investigate the impact of the just energy transition on employment as well as the feasibility of implementing the just energy transition within the South African context. A diagram of the themes and codes that emerged from the interviews are presented below in figure 4. The respondents' responses are captured and are available on the link provided on annexure 3. Only the codes in table 4 that address the research questions of the impact of the JET on employment and the implementation feasibility will be discussed in the section below figure 6 in line with the research questions.

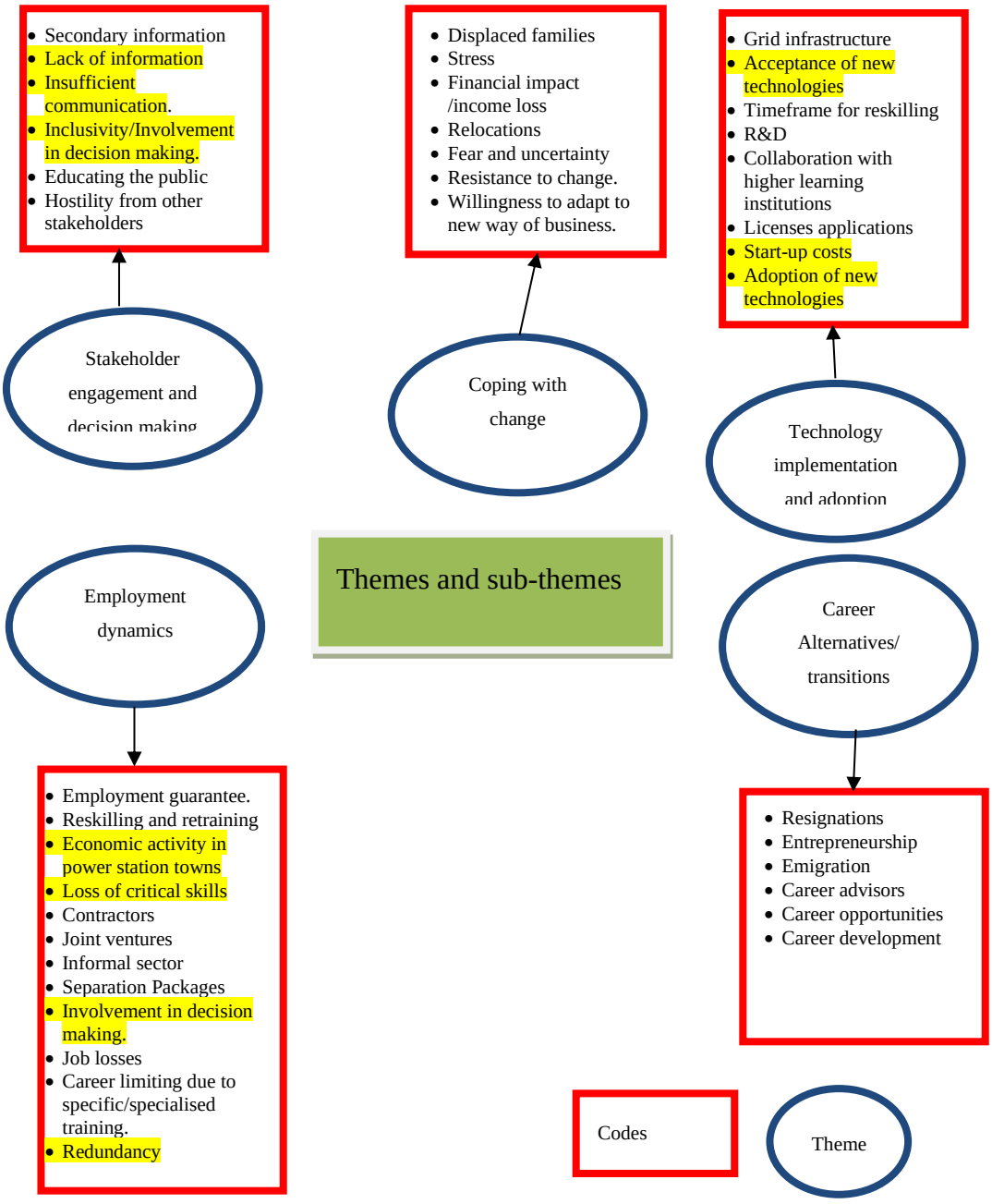

Figure 4: Summary of themes and subthemes from interviews

Table 4 below presents the research questions, the relevant themes and codes that will be analysed in line with this research.

Table 5: Research questions linked to themes and codes.

Research Questions	Theme	Codes
Research Question 1: What impact will JET have on the current employment climate in South Africa?	**Theme 1: Employment dynamics**	Employment guarantee
		Redundancy
		Loss of critical skills
		Economic activity in affected towns
	Theme 2: Stakeholder engagement and decision making.	Lack of information
		Inclusivity and involvement in decision making
Research Question 2: How feasible is the implementation of JET within the South African context?	**Theme 3: Technology implementation and adoption**	Network grid infrastructure
		Costs
		Adoption of new technologies

4.4 Research Question 1: What impact will the JET have on the current employment climate in South Africa?

4.4.1 Theme 1: Employment dynamics

This theme looked into perceived impact that respondents have with regards to employment in response to the JET. One of the codes that emerged was that of **employment guarantee**. Question 14 of the interview guide required respondents to give their views on and their concern about the possibility of job loss due to the transition. Respondent 4 replied that she was: "*Very concerned. Obviously, the change will come with some cuts."* Respondent 5 responded as follows: "*It is a great concern…I mean like for instance, myself as a shift manager, you can only have a certain number of shift*

managers in a power station.", while respondent 8 said that : "*It does concern us a lot you know because instead of 10 electrical engineers you just need 3 so where will the other 7 go? So it is a concern, it is a concern definitely".* Question 15 was a follow up to question 14 and probed the respondents on and whether the transition will have a positive or negative impact on their current jobs. Responded 5 said that the transition would have "*A very negative impact…".* This was aligned to respondent 5 who alluded that *"...I'm seeing more negative than positive on my job"*. Respondent 8 further cemented the two responses by saying that "*For Electrical Engineers it is a good thing, and for C&I (Control and Instrumentation engineers). But for other people it is definitely negative"*. The respondents, although all permanent are still very concerned with the possibility of job losses due to the transition.

Another concern amongst the respondents is that they will ultimately be out of employment because there might be no more work available for them at their new power stations due to **redundancy**. In the closing of Komati power station, the employees were redeployed to other power stations. This will also be the case for the Grootvlei power station employees in the near future. Respondent 7, referring to the replacing of coal-fired stations with renewables, stated that "…*you only need 1 EMT employee who will be maintaining or 3 so there won't be a need for me*." Respondent 11 supported this statement in her response captured as follows: "…*you can't close the 200 MW then you put a 50 (MW) because obviously you won't need all that staff that is there generating*." Respondent 5 looked at it from a competition perspective and his views were: "*If Hendrina* (power station) *closes in the next three years or how many skilled operators are we gonna* (going to) *have? You know, roaming around you, you understand, then it becomes survival of the fittest. If Majuba* (power station) *has one vacancy of a shift manager, there will be about 15 shift managers with different level of education and experience, you know, so it becomes a tough competition"*. Respondent 9 also shared the same views. He explained that being moved to other stations may cause negative employee dynamics. His response was: "…*I'm a supervisor … if there is a vacancy of one supervisor it means now I'm closing for the guy that was going to be promoted. So those are also in-house problems that affect everyone."*

Twenty seven percent (27%) of the respondents also stated that resigning and venturing into entrepreneurship may be an option should the need for their skills no longer be

required. Respondent 8, an electrical engineer, stated that their skillset are still valuable in other countries, and should the need arise, he would emigrate. His response when question 17 of the interview guide asked if his current job were to be affected by the transition, what career changes would he consider? was "*Definitely I would leave SA. That's a given, that's where most of us are thinking. We're leaving SA, we are looking at United Arab Emirates, that's where they still want our skills".* Respondent 9 said he would take a separation package if is presented to him so he can venture into entrepreneurship. **Loss of critical skills** also came out as a sub-theme. Twenty seven percent (27%) of the respondents also stated that resigning and venturing into entrepreneurship may be an option should the need for their skills no longer be required. Respondent 8, an electrical engineer, stated that their skillsets are still valuable in other countries, and should the need arise, he would emigrate. His response when question 17 of the interview guide asked if his current job were to be affected by the transition, what career changes would he consider? was "*Definitely I would leave SA. That's a given, that's where most of us are thinking. We're leaving SA, we are looking at United Arab Emirates, that's where they still want our skills"*. Respondent 9 said if he will take a separation package if is presented to him so he can venture into entrepreneurship. Respondent 8 highlighted that ESKOM would be at a loss considering the time, revenue and resources that went into training and skilling for current roles.

4.4.1.1 Analysis of Theme 1: Employment Dynamics

Respondents were asked what impact would transitioning to renewables from fossil fuels would have on their employment. The results show that 75% of the respondents felt it would have a negative impact. This implies that a majority of the respondents are concerned with the possibility of a job loss as result of the transition. Khobai et al. indicate that employing renewable energy sources has a negative, statistically significant impact on long-term unemployment (Khobai, Kolisi, Moyo, Anyikwa, & Dingela, 2017). If the power stations are shut down because they are old or because of choices about the supply mix, it would have a negative short-term effect on that area, even if no other steps were taken (Bolmann, Horridge, Inglesi-Lotz, Roos, & Stander, 2019). Contrary to this, ESKOM permanent employees are guaranteed their jobs as the organisation redeployed employees from the closed Komati power station to other power stations. The remaining 25% felt that the transition would have no impact on their employment as they would be

able to leverage their skills on the technological change. In the literature review Mertins-Kirkwood & Deshpande (2019) argue that if the relative marginalisation of different sorts of workers in the sector is not recognised and addressed the that future zero-carbon economies could be as unfair and unjust as today's fossil fuel-based economies (Mertins-Kirkwood & Deshpande, 2019). This view is supported in that the support services to these stations i.e., contractors, security guards, cleaners who rely on the stations as a source of income will be impacted negatively by the closure of the station if alternative economic opportunities are not created in these towns.

A just transition should involve providing opportunities for retraining and reskilling of workers to adapt to new technologies and industries-not only limited to the electricity sector. From the responses given by the semi-skilled employees, their training is only applicable to coal fired power stations. This means that they would not be able to use the experience and skills acquired in other sectors or in the renewable energy space. The literature review in Chapter 2 also highlighted that while renewables have the potential to generate jobs in South Africa, it is important to determine whether the positions will be suitable for the existing skillsets because alternative careers typically require skills most of which are non-transferable (Khobai & Le Roux, 2017). According to Minnar (2020), the staff compliment in ESKOM's Generation division is 11 700 (Minnar, 2020). It is therefore unlikely that all these employees will be offered training programs to develop skills that are relevant to emerging sectors in the renewable energy industry although the CSIS & CIF (2021) emphasis that for the transition to be just, it is essential to provide workers and marginalised populations with social protection programmes, career transition support, and skill development (CSIS & CIF, 2021).

The respondents at the power stations highlighted that although being redeployed means they would still be employed, the main issue is the role that they would play at the power stations they are redeployed to. This suggests that the redeployment of employees to other stations will result in overstaffing. Overstaffing will result in reduced productivity due to an excessive number of individuals working on the same project, causing inefficient resource utilisation. Under-utilisation of employees can also result in resignations thereby increasing the unemployment rate. Hanto et al. (2021) in the literature review states that to reduce employment losses in Mpumalanga, where most coal plants and coal-fired power stations are located, efforts should be directed towards economic diversification

by generating possibilities in sectors like transport, manufacturing, and agriculture. (Hanto, et al., 2021).

A very interesting find was that the scarce, critical and core skills are resigning in ESKOM. The country is experiencing a skills shortage, where the number of skilled individuals graduating from the school system is insufficient to fulfil the need (Stern & Szalontai, 2006). Further research can be done to determine whether the decline in skills also hinders the public sector's capacity to provide essential social services. Table 5 below shows 691 engineers, technicians and artisans resigned and retired from ESKOM between 2019 and 2022.

Table 6: Resignation and retirement of skilled staff at ESKOM (Business-Tech, 2022)

ARTISANS, ENGINEERS & TECHNICIANS & RESIGNED / RETIRED FY2020 TO FY2022 (ESKOM)										
	FY2019/20			FY2020/21			FY2021/22			
	RESIGNED	RETIRED	TOTAL	RESIGNED	RETIRED	TOTAL	RESIGNED	RETIRED	TOTAL	GRAND TOTAL
(i) ARTISANS	**-24**	**-38**	**-62**	**-12**	**-35**	**-47**	**-27**	**-53**	**-80**	**-189**
African	-12	-25	-37	-5	-20	-25	-12	-30	-42	-104
Asian	0	0	0	0	0	0	0	0	0	0
Coloured	-1	-4	-5	-4	-2	-6	-10	-4	-14	-25
White	-11	-9	-20	-3	-13	-16	-5	-19	-24	-60
(ii) ENGINEERS	**-91**	**-7**	**-98**	**-66**	**-7**	**-73**	**-95**	**-4**	**-99**	**-270**
African	-30	-2	-32	-18	-3	-21	-33	0	-33	-86
Asian	-13	0	-13	-12	-2	-14	-20	0	-20	-47
Coloured	-5	0	-5	-3		-3	-1	0	-1	-9
White	-43	-5	-48	-33	-2	-35	-41	-4	-45	-128
(iii) TECHNICIANS	**-71**	**-21**	**-92**	**-29**	**-23**	**-52**	**-56**	**-32**	**-88**	**-232**
African	-52	-1	-53	-23	-4	-27	-33	-6	-39	-119
Asian	-2	0	-2	-2	0	-2	-6	0	-6	-10
Coloured	-2	-2	-4	-4	-1	-5	-10	-1	-11	-20
White	-15	-18	-33	0	-18	-18	-7	-25	-32	-83
TOTAL	**-186**	**-66**	**-252**	**-107**	**-65**	**-172**	**-178**	**-89**	**-267**	**-691**

4.4.2 Theme 2: Stakeholder engagement and decision- making.

The purpose of this theme was to evaluate if enough social dialogue had been established with those that will be impacted by the transition. The questions probed whether the respondents had a full understanding of what the JET is and reasons for implementation thereof. Fifty-five percent (55%) of the interviewed respondents stated that they were not adequately informed about the JET and what it entails. Forty five percent (45%) explained that information was shared via email and some information sessions were headed by the teams from the ESKOM Head Office to come explain the process. Question 6 of the interview guide required respondents to provide their understanding of the Just Energy

Transition. Respondent 2 said: "…*they move from using coal to these energy sources like your wind and solar"* while respondent 4 described it as "…*moving from coal to other energy sectors*". An interesting find was that 4 out of 5 employees at Komati Power station state that they were not provided with sufficient information regarding the closure of the power station. Question 7 of the interview guide probed whether respondents were adequately informed about JET and what it entails. Respondent 1 said "…*no…*", respondent 3 found out about JET through secondary information and their response was "*…not really, just heard about from the news and stuff but there was nothing much was said to us we had to research on our own to find out what it really is…"* while respondent 7 highlighted that "…*we didn't get a(n) (in)depth view of it on my side…".* From the above, it can be seen that a majority of the respondents **lacked sufficient information** when it comes to the JET.

Delving into the level of involvement of affected parties in decision making regarding the transition, respondents feel that they do not have a voice and will just have to comply with whatever is decided by the employer. Respondent 1 when asked Question 10 of the interview guide i.e. what the consequences were of Komati closure, they responded as follows: "*Moving you know, now you are you are forced to go to Kendall (power station) …I didn't have a choice because I needed a job."* Respondent 7 stated that: *"plans were made to reduce staff and plans were made to relocate other employees"*. These plans according to the respondent were final without inputs from the affected employees. Respondent 3 further added that *"… I can say we know what needs to be done but we are voiceless. Yes, we do raise our concerns, but they fall on deaf ears…".* According to the respondents there was **no sufficient dialogue** established to better prepare and educate them about the JET.

4.4.2.1 Analysis of Theme 2: Stakeholder engagement and decision making.

Although the respondents are familiar with the JET concept, it is clear that there is not an in-depth understanding what the Just Energy Transition entails. The very core of JET is premised on "leave no one behind" but is clearly seen through the responses that the affected parties have been left behind. It is evident by the respondents' responses that not enough is being done in ensuring that no one is left behind in that there is a clear **lack of**

information amongst those impacted. Due to inadequate information relayed regarding the just energy, respondents relied on external sources for information regarding the Just Energy Transition. There is no i**nclusivity in decision making.** The procedural tenant of the Justice Theories covered in Chapter 2 of the literature review emphasises that as part of the procedural justice, all parties to be affected must be part of the decision-making. In the literature review it was discussed that ESKOM had engaged in communication with workers who will be affected by the transition through its stakeholder and change management programmes (ESKOM, 2022). The literature also highlighted that environmental justice in energy transitions requires the active involvement of affected communities in decision-making to address their concerns and ensure their views are heard. This is not evident given the respondents responses.

ESKOM through its stakeholder and change management initiatives has established dialogue with workers to be impacted by the transition (ESKOM, 2022) through decision-making participation and inclusion, as well as the quality of governance processes (Bennett, Blythe, Cisneros-Montemayor, Singh, & Sumaila, 2019).

4.5 Research Question 2: How feasible is the implementation of JET within the South African context?

4.5.1 Theme 3: Technology implementation and adoption

While there is an urgent need to address the climate challenges caused by the use of fossil fuels for power generation, there are technical aspects that need to be taken into account. This theme addressed the techno-economical aspect and the feasibility of implementation with the current network configuration and the current supply challenges the country faces. Thirteen of ESKOM's coal fired stations are located in Mpumalanga province. The power stations are located close to the coal mines which is a primary input to electricity generation. It is from this central location that electricity is transmitted to the rest of the country. The concern from the respondents was that the technologies that JET introduces will not be feasible in Mpumalanga as there is not enough sun nor wind to produce enough electricity for the country. This means that a new **transmission grid network** will have to be built from the areas where renewables are optimal to the rest of the country. Respondent 6's views were "… *I think if one can implement this wind energy whereby*

there is a constant wind speed, you know close to the harbours and so forth, you might have a long term solution but then now you know that some days there is no wind then it means you are not generating." Respondent 11 added that *"…they say they are gonna* (going to*) put in wind turbines. There's no wind here. The wind stuff they can install at Western Cape not here at Grootvlei"*, further cementing Respondents 6's response in that Mpumalanga is not a feasible area for wind turbines.

From an economical perspective, transitioning to cleaner energy sources requires a huge capital outlay. If sunlight as a source of energy is used, the energy derived from the sun needs to be stored in batteries so that it can be utilised at a later stage or instantaneously. If wind is opted as an alternative energy source, wind turbines need to be installed. The existing coal fleet will need to be replaced. Respondent 6 stated that although renewables are the answer to achieving the environmental targets, the stumbling block is the costs associated with transitioning. His response to the cost issue was "…*previous GCE* (Group Chief Executive) *would come and talk around the just energy transition where emphasis was on renewables, you know and so forth and obviously the issue was cost and so forth in terms of implementation from ESKOM point of view."* Respondent 8 also highlighted that new licences will need to be applied for, which will come at a cost as well. He explained that "…*Obviously now with their* (renewables)*coming into play, you have to reapply for licenses".* The **cost** perspective was also a concern for some of the respondents.

Looking at the acceptance and **adoption of the new technologies**, there was a mixed reaction from the respondents with some open to the idea of being reskilled and trained for these new technologies. Others are sceptical about the relevance of their roles in respect to renewables and not sure whether they would be able to adapt to the new way of business. Respondent 8 "…*So now you going to have to reskill people when it comes to reskilling people, you can't now take an operator and reskill them for (example) coding that quickly."* Respondent 4 cited that her concern is having to adapt to these new technologies at an "old age". She responded that "*...I will be approaching my 40's or early 40's, the brain is tired (translated from isiZulu) so you must start from scratch adapting to new things…"*. Respondents 5, 6 and 8 where optimistic about the new technologies and their responses respectively were: " *There are a number of opportunities and it's just for us to equip ourselves with the necessary skills", "one can go and manage*

the renewable energy site, which is a new challenge and it would be new things that one needs to learn in there…" and *"..for me it's about the new tech, looking forward to the new tech and learning about new technology."*

4.5.1.1 Analysis of Theme 3: Technology implementation and adoption

Renewable energy projects are concentrated in certain regions with minimal network infrastructure i.e., Northern Cape for sun and the coastal areas for wind. Transmission strengthening enhancements are urgently needed to connect further projects and evacuate more power (Renaud, Tyler, Roff, & Steyn). The overall transmission capital plan for period 2021-2030 is approximately R118bn to ensure a sufficient and dependable transmission system (Scheppers, 2020). With the availability of funds, the necessary infrastructure modification will be possible to allow renewable energy to enable access to the national grid. Renewable energy necessitates initial capital investment despite being more cost-effective than fossil fuels in the long run (Lernferna, 2023). As discussed in Chapter 2, the developed regions have donated billions of rands to the South African government to move away from the use of coal for electricity generation due to the negative impacts it has on the environment. The country is expected to receive over $20 billion, exceeding the initial commitment of $8.5 billion by the JETP, to facilitate a just transition (Hadley, Mustapha, Colenbrander, Miller, & Quevado, 2022). The conditions that this funding come with should also be closely examined. Approximately R650 billion will be allocated for infrastructure projects, including decommissioning coal-fired power stations, enhancing the transmission grid, and developing new renewable energy producing capacity (Lernferna, 2023). The international donor community is presently supporting South Africa's just energy transformation through the Climate Investment Funds (CIF), the Accelerating Coal Transition (ACT) Investment Plan (IP) and the Just Energy Transition Partnership (The World Bank, 2023). These funding initiatives are crucial in enabling ESKOM to transition to cleaner energy technologies.

An important finding with regards to the adoption of new technologies is that the respondents that are willing to learn about the new technology that come with renewables are also the same respondents that somewhat have a better understanding of the JET. This suggests that if the respondents who do not have a clear understanding of the JET and the

reasons for implementing JET; their attitudes towards the JET could possibly be amended if they are adequately exposed to renewables and the environmental and social benefits of renewable energy, emphasizing the positive impact on communities and the planet.

4.6 Summary of chapter

The chapter started by presenting the demographic profile of the respondents interviewed for the study. The primary focus was on race, gender, age and current position held at ESKOM. The responses were captured on Microsoft Excel from which the relevant themes and codes were formed to discuss the data that aligned with the research questions of the study. From the respondent's responses it can be seen that there are mixed views with regards to the JET and that its implementation may create opportunities or might have a negative impact on employment. The latter part of the chapter was focused on the analysis of the findings from themes and codes that were selected in line with the study. The first aim of the research was to investigate the impact that the Just Energy Transition (JET) will have on the employment outlook succeeded by the feasibility of implementing the JET. This section analysed and discussed the findings as they conveyed the perspectives, encounters, and beliefs of the respondents in line with the research questions. The theoretical concepts and frameworks outlined in Chapter 2's literature review were compared to the research findings. Commonalities, distinctions, and novel findings that enhanced the existing literature on this subject were identified and analysed.

CHAPTER 5. CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

Switching to renewables has the potential to create job opportunities in manufacturing, agriculture, and the maintenance of renewable energy systems. As the economy becomes more diverse, more jobs will be made, especially in renewable energy. However, these jobs might not include jobs for miners or people who already work in the formal or informal coal value chain. Alternative employment could also mean lower pay and less responsibility, which would cause people to lose their sense of self, socioeconomic status, and sense of pride in their profession (Harrahill & Douglas, 2019). ESKOM has mentioned developing microgrid manufacturing units as well as retraining and reskilling personnel to work in other sectors of the economy (ESKOM, 2022). The World Bank (2023) posits that employees at the Komati plant will get various support measures such as transfers to other Eskom projects, re-skilling and upskilling for deployment to renewable plants, and voluntary separation packages for individuals opting to retire from the coal sector (The World Bank, 2023). There might also be other types of new economic prospects outside the energy sector therefore a comprehensive and diverse economic strategy has a better chance of mitigating the effects of the coal decline and promoting a fair shift to alternative economic undertakings (Strambo, Burton, & Atteridge, 2019).

Due to the nature of their jobs and the associated skills they have, the closure of the power stations has instilled a fear of joblessness following the plight of moving to renewable energy sources. Lack of communication with communities and unclear structures have led to mistrust of decarbonisation efforts, which could make it harder for a fair shift to strong sustainability (Harrahill & Douglas, 2019). ESKOM through its stakeholder and change management initiatives has established dialogue with workers to be impacted by the transition (ESKOM, 2022) through decision-making participation and inclusion, as well as the quality of governance processes (Bennett, Blythe, Cisneros-Montemayor, Singh, & Sumaila, 2019). However, a majority of affected parties are still unclear of what the JET is, what it entails and how ESKOM plans on rolling it out.

Limitations and areas for further studies

Relying solely on interviews with ESKOM employees to assess the impact of the just energy transition presents inherent limitations. Firstly, employees may exhibit bias or reluctance to share candid perspectives due to organizational loyalty or fear of repercussions. Moreover, ESKOM staff may lack a comprehensive view, focusing on immediate job concerns rather than broader societal implications. The exclusive reliance on internal perspectives may overlook the experiences of communities affected by the transition, neglecting their unique challenges and needs. Additionally, interviewing only ESKOM employees may result in a skewed portrayal, as their perspectives might be influenced by the company's communication strategies. Based on the limitations mentioned, other researchers could explore the following areas to provide a more comprehensive understanding of the just energy transition's impact:

1. **Community perspectives.**

Conduct interviews and focus groups with members of the communities directly affected by the transition. This can include local residents, business owners, and community leaders to understand their unique challenges, needs, and perspectives on the transition. To achieve a more holistic understanding of the just energy transition's impact, it is imperative to incorporate diverse viewpoints, including those of affected communities, environmental experts, and other stakeholders, ensuring a more nuanced and comprehensive evaluation.

2. **Policy and governance.**

Analyse the role of governmental policies and regulations in shaping the transition. This includes examining the effectiveness of policy measures i.e. policy instruments used to facilitate the transition, and evaluating the effectiveness thereof, the role of public sector support be it in capacity building or direct investments in the transition, and the influence of international agreements and frameworks in the form of regional corporation and global agreement.

Recommendations

Employees need to be encouraged to see the transition as an opportunity for growth and development rather than a threat to their current roles. ESKOM can embark on ensuring clear and honest communication regarding the company's strategies, schedules, and the reasoning for transitioning to renewable energy. This can be by means of compulsory online courses, certificates, and materials that address the most recent advancements in the renewable energy industry. An innovative culture can also be promoted by motivating staff to generate ideas for enhancing renewable energy processes and incorporating them into the current infrastructure. Creative solutions can also be acknowledged and incentivized that aid in the smooth transition. This will keep employees engaged, motivated and most importantly a part of the transition as advocated by the *just* transition. Due to the long history of the use of fossil fuels for power generation, it should also be established what skillsets are required in the renewable energy sector as these may not generally be available in the country and may need to be acquired from elsewhere. Additionally, policies and programs that promote renewable energy and energy efficiency should be designed with equity in mind, considering the needs and circumstances of different communities. This may include targeted incentives and subsidies for low-income households, as well as policies that prioritize the deployment of renewable energy projects in areas that have historically been impacted by pollution and environmental degradation.

Once the above factors have been finalised JET can co-exist in a positive way with the country’s priority to grow the economy and create jobs and address the effects of switching from conventional fossil fuel-based energy systems to greener alternatives on jobs and the economy.

Table 7: Consistency table: research questions, propositions, data collection and data analysis

RQ #	Research Question or Objective		Data collection detail	Data analysis method
1.	The impact on Just Energy transitions and employment outlook in SA	*There is adequate understanding of JET.*	Interview guide question 7	Thematic analysis
		The transition to clean energy will result in jobs losses for some people but new job opportunities for others.	Interview guide question 14	Thematic analysis
		The lack of social dialogue on the impacts of the energy transition may result in job losses and societal unrest.	Interview guide question 15	Thematic analysis Thematic analysis
2	The feasibility of the JET	*Is it the right time to implement JET given the employment challenges?*	Interview guide question 9	Thematic analysis
		Have adequate measures been put in place to ensure a just transition?	Interview guide question 13	Thematic analysis

REFERENCES

Annecke, W., & Wolpe, P. (2022). *What role for social policies in the framework of the just transition in South Africa?*

Atkinson, D. (2012). *Inequality and economic marginalisation: Creating access to economic opportunities in small and medium towns.* Pretoria: TIPS.

Atmowardoyo, H. (2018, January). Research methods in TEFL studies: Descriptive research, case study, error analysis, and R &D. *Language Teaching and Research, 9*(1), 197-204. doi:http://dx.doi.org/10.17507/jltr.0901.25

Axon, S., & Morissey, J. (2020). Just energy transitions? Social inequities, vulnerabilities and unitended consequences. *Buildings and Cities, 1*(1), 393-411.

Ayre, J., & McCaffery, K. J. (2022). Research Note: Thematic analysis in qualitative research. *Journal of Physiotherapy, 68*(1), 76-79.

Azaliah, R., Kurniawan, H., Hartono, D., & Widyastaman, P. A. (2023). The convergence of energy intensity in developing countries:a spatial econometric analysis with Indonsia's provincial panel data. *Environment, Development and Sustainability*.

Bennett, N. J., Blythe, J., Cisneros-Montemayor, A. M., Singh, G. G., & Sumaila, R. U. (2019). Just transformations ot sustainability. *Sustainability, 11*(3881). doi:10:3390/su11143881

Bennett, N. J., Blythe, J., Cisneros-Montemayor, A. M., Singh, G. G., & Sumaila, R. U. (2019). Just transformations to sustainability. *Sustainability, 11*(3881). doi:10:3390/su11143881

Bolmann, H. R., Horridge, J. M., Inglesi-Lotz, R., Roos, E. L., & Stander, L. (2019). Regional employment and economic growth effects of South Africa. *Energy Policy*, 830-837.

Bosca, H. D., & Gillespie, J. (2018). The coal story: Generational coal mining communities and strategies of energy transition in Australia. *Energy Policy, 120*, 734-740.

Bott, G., & Tourish, D. (2016). The critical incident technique reappraised: Using critical incidents to illuminate organizational practices and build theory. *Qualitative Research in Organizations and Management:An International Journal, 11*(4), 276-300. doi:10.1108/QROM-01-2016-1351

Bulbulia, T. (2022). *Workers must play central role in shaping just energy transition, unions insist.* Online: Engineering News.

Bulbulia, T. (2022a). *NUMreport supports just energy transition,but with caveats.* Online: Engineering News.

Business-Tech. (2022). *South Africa is losing hundreds of engineers and technicians.* Online: Business Tech.

Cock, J. (2019). Resistance to coal inequalities and the possibilities of a just transition in South Africa. *Development Southern Africa , 36*(6), 860-873. doi:https://www.tandfonline.com/action/showCitFormats?doi=10.1080/0376835X.2019.1660859

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches.* Los Angeles: SAGE.

CSIS, & CIF. (2021). *A framework for just transitions.* Just Transition Initiative.

Dalit, A. (2023). *A just energy transition in South Africa: legal perspectives.* Johannesburg: University of the Witwatersrand.

Department of RDLR. (2018). *Land audit report:Phase II Priveate land ownership by race, gender and nationality.* Pretoria: Department of rural development and land reform.

Department-of-Energy. (2018). *South African Energy Sector Report.* Pretoria: Department of Energy.

DMRE. (2021). *Towards a just energy transition framework in the minerals and energy sector.* Department of mineral resources and energy.

Durrheim, K. (2004). *Research in practice: Applied methods for the social sciences.*

ESKOM. (2022). *Just energy transition: Re-invigorating, rejuvenating and redefining Eskom's destiny as we lead the energy transition into the future.*

ESKOM. (2022a). *As Komati coal-fired power station reaches end of life, renewable energy project takes shape.* Retrieved from https://www.eskom.co.za/as-komati-coal-fired-power-station-reaches-end-of-life-renewable-energy-project-takes-shape/

ESKOM. (2023). *Company information*. Retrieved from ESKOM: https://www.eskom.co.za/about-eskom/company-information/

Field, T.-L. (2021). A Just Energy Transition and Functional Federalism: A case for South Africa. *Transnational Environmental Law 10:2*, 237-261.

Flanagan, J. C. (1954). The critical incdent technique. *Physcological Bulletin,* 327-358.

Füllemann, Y., Moreau, V., Vielle, M., & Vuille, F. (2020). Hire fast,fire slow: the employment benefits of energy transitions. *Economic Systems Research*, 202-220. doi:https://doi.org/10.1080/09535314.2019.1695584

García-García, P., Carpintero, Ó., & Buendía, L. (2020). Just energy transitions to low carbon economies: A review of the concept and its effects on labout and income. *Energy Research and Social Science, 70*. doi:https://doi.org/10.1016/j.erss.2020.101664

Geels, F. W. (2011). Multilevel perspectives on sustainaibility transitions transitions: responses to seven critisisms. *Environmental Innovation and Societal Transitions 1*, 24-40.

Goldemberg, J. (2020). The evolution of the energy and carbon intensities of developing countries. *Energy Policy, 137*.

Gunbayi, I. (2020). Knowledge-constructive interest and social paradigms in guiding mixed methods research (MMR). *Journal of Mixed Methods Studies*(1), 44-56. doi:10.14689/jomes.2020.1.3

Hadley, S., Mustapha, S., Colenbrander, S., Miller, M., & Quevado, A. (2022). Appendix 1: South Africa's Just Energy Transition Partnership. *Country platforms for climate action: Something borrowed, something new?*, 57-63. Retrieved from http://www.jstor.org/stable/resrep51215.12

Hägele, R., Iacobuţă, G. I., & Top, J. (2022). Addressing climate change goals and the SDGs through a just energy transitions? Empirical evidence from Germany and South Africa. *Journal of Intergrative Environmental Sciences*, 85-120.

Hanto, J., Krawielicki, L., Krumm, A., Moskalenko, N., Löffler, K., Hauenstein, C., & Oei, P.-Y. (2021). Effects of decarbonization on the nergy system and related employment effects in South Africa. *Environmental Science and Policy*, 73-84.

Harrahill, K., & Douglas, O. (2019). Framework development for 'just transition' in coal producing jurisdictions. *Energy Policy, 134*. doi:https://doi.org/10.1016/j.enpol.2019.110990

Hefforn, R. J., & McCauley , D. (2018). What is the Just Transition. *Geoforum 88*, 74-77.

Hermanus, L., & Montmasson-Clair, G. (2021). *Making sense of jobs in South Africa's just energy transition: Managing the impact of a coal transition on employment.* TIPS. doi:https://www.tips.org.za/images/Policy_Brief_Making_sense_of_jobs_in_South_Africas_just_energy_transition_Managing_the_impact_of_a_coal_transition_on_employment_April_2021.pdf

Herzer, D. (2024). The impact of domestic R&D and North-South R&D spillovers on energy intesnity in developing countries. *Economic Change and Restructuring, 57*(33).

Hirsch, T., Matthess, M., & Funfgelt, D. J. (2017). Guiding principles & lessons learnt for a just energy transition in the Global South. *Global Policy and Development, 28*.

Houston, L. J., & Ruppel, O. C. (2022). Just Energy Transitions in Progress? The Partnership between South Africa and the EU. *Journal for European Environmental & Planning Law, 19*, 31-54.

Hsu, S., & Naus, S. (2009). Employment impacts of a ‘green’ energy transition in China. *China Economic Journal, 2*(2), 219-237.

Ibrahim, I. D., Hamam, Y., Alayli, Y., Jamiru, T., Sadiku, E. R., Kupolati, W. K., . . . Eze, A. A. (2021). A review on Africa energy supply throughrenewable energy production:Nigeria, Cameroon, Ghana and South Africa as a case study. *Energy Strategy Reviews, 38*.

IEA. (n.d). *Coal in net zero transitions: Strategies for rapid, secure and people-centred change.* Paris.

ILOSTAT. (n.d.). *Labour force statistics (LFS,STLFS,RURBAN databases)*. Retrieved from https://ilostat.ilo.org/resources/concepts-and-definitions/description-labour-force-statistics/#:~:text=The%20labour%20force%20participation%20rate%20is%20the%20number%20of%20persons,the%20number%20of%20persons%20unemployed.

Ishak, N. M., & Bakar, A. (2014). Developing sampling frame for case study: Challenges and conditions. *World Journal of Education, 4*(3). doi:doi:10.5430/wje.v4n3p29

Janipour, Z., de Nooij, R., Scholten, P., Huijbregts, M. A., & de Coninck, H. (2020). What are the surces of carbon locki-in in energy intensive indusrty? A case study ito Dutch chemicals production. *Energy Research & Social SCience, 60*.

Kaggwa, D. M., & Sithole, S. (2019). Making South Africa’s migration to Fourth Industrial Revolution just for workers:A lesson from the just energy transition framework to a low-carbon economy. *Labour 4IR and Just Transition*.

Khobai, H., & Le Roux, P. (2017). The Relationship between Energy Consumption, Economic Growth and Carbon Dioxide Emission: The Case of South Africa. *International Journal of Energy Economics and Policy*, 102-109.

Khobai, H., Kolisi, N., Moyo, C., Anyikwa, I., & Dingela, S. (2017). *Renewable energy consumption and unemployment in South Africa.* Retrieved from https://mpra.ub.uni-muenchen.de/83160/

Khobai, H., Kolisi, N., Moyo, C., Anyikwa, I., & Dingela, S. (2017). *Renewable energy consumption and unemployment in South Africa.* Gqeberha. Retrieved from https://mpra.ub.uni-muenchen.de/83160/

Lawrence, A. (2020). Energy decentralisation in South Africa: Why past failurespoints to future success. *Renewable and Sustainable Energy review, 120*. doi:ttps://doi.org/10.1016/j.rser.2019.109659

Ledger, T. (2020). *A just distribution:the overlooked role of energy distribution policy and governance in achieving a just energy transtion in South Africa.* Retrieved from https://justtransitionforall.com/wp-content/uploads/2022/10/20210421_AJustDistribution_EnergySociety_Ledger.pdf

Lernferna, A. (2023). South Africa's unjust climate reparations: a critique of the Just Energy Transition Partnership. *Review of African Political Economy, 50*(177-178), 491-501.

Makgetla, N. (2021). *The just transition in coal.* TIPS. Retrieved from file:///C:/Users/tsukudak/Downloads/Working_Paper_PCC_The_Just_Transition_in_coal_2021.pdf

Mertins-Kirkwood, H., & Deshpande, Z. (2019). *Who is included in a Just Transition.* Ottawa.

Minnar, U. J. (2020). Policy implications of the World Bank utility staffing analysis in South Africa. *Utilities Policy, 67*.

Mirzania, P., Gordon, J. A., Balta-Ozkan, N., Sayan, R. C., & Marais, L. (2023). Barriers to powering post coal: Implications for a just energy transition in South Africa. *Energy Research & Social Science, 101*. doi:https://doi.org/10.1016/j.erss.2023.103122

Mukherjee, P. (2023, February 28). *South Africa's unemployment drops again after year of job gains*. Retrieved from Reuters: https://www.reuters.com/world/africa/south-africas-official-unemployment-rate-dips-327-fourth-qtr-2023-02-28/

Müller, F., & Claar, S. (2021). Auctioning a 'just energy transition'? South Africa's renewable energy procurement programme and its implications for transition strategies. *Review of African Political Economy*, 333-35.

Mvumvu, Z. (2019, February 13). *SACP blames independent power producers for 'destroying' Eskom*. Retrieved from Times Live: https://www.timeslive.co.za/politics/2019-02-13-sacp-blames-independent-power-producers-for-destroying-eskom/

Nassaji, H. (2020). Good qualitative research. *Language, Teaching Research, 24*(4), 427-431. doi:10.1177/1362168820941288

National-Treasury. (2023, February 22). *Minister Enoch Godongwana: 2023 Budget Speech.* Retrieved from South African Government: https://www.gov.za/speeches/minister-enoch-godongwana-2023-budget-speech-22-feb-2023-0000

NPC. (2016). *National Development Plan 2030. Our future-make it work (ISBN 978-0-621-41180-5).* Pretoria.

Ordonez, J. A., Jakob, M., Steckel, J. C., & Ward, H. (2023). India's just energy transition: Political economy challenges across states and regions. *Energy Policy, 179*(113621).

Presidential Climate Commission. (2022). *A Framework for a Just Transition in South Africa.* Pretoria: Presidential Climate Commission.

Renaud, C., Tyler, E., Roff, A., & Steyn, G. (n.d.). *Accelerating the rollout of renewables in South Africa: What's stopping us?* Rondebosch: Meridian Economics.

Rentier, G., Lelieveldt, H., & Kramer, G. J. (2019). Varieties of coal-fired power phase-out across Europe. *Energy Policy*, 620-632.

Ritchie, H., Roser, M., & Rosado, P. (2022). *South Africa: Energy country profile.* Retrieved from https://ourworldindata.org/energy/country/south-africa

Sammut, R., Griscti, O., & Norman, I. J. (2021). Startegies to improve response rates to web surveys:A literature review. *International Journal of Nursing Studies, 123*. doi:https://doi.org/10.1016/j.ijnurstu.2021.104058

SA-News. (2016, April 2022). *SA ccommitted to Sustainable Developmental Goals*. Retrieved from Sa News: https://www.sanews.gov.za/south-africa/sa-committed-sustainable-development-goals#:~:text=Pretoria%20%E2%80%93%20South%20Africa%20is%20committed%20to%20aligning,as%20well%20as%20tackle%20climate%20change%20by%202030.

SA-NEWS. (2022a). *Eskom loan "significant step" for Just Energy Transition.* Retrieved from https://www.sanews.gov.za/south-africa/eskom-loan-significant-step-just-energy-transition

SA-News. (2022b, March 24). *Just energy transition can change the economy*. Retrieved from SA News: https://www.sanews.gov.za/south-africa/just-energy-transition-can-change-economy

Scheppers, S. (2020, October 2021). ESKOM Transmission Group Executive . (C. Paten, Interviewer)

Sovacool, B. K. (2016). How long will it take? Conceptualizing the temporal dynamics of energy transitions. *Energy Research & Social Science*, 202-215.

Sovacool, B. K., Baker , L., Martiskainen, M., & Hook, A. (2019). Process of elite power and low carbon pathways- Experimentation, financialisation, and dispossession. *Global Environmental Change 59*.

Sovacool, B. K., Martikainen, M., Hook, A., & Bake, L. (2019). Decarbonisation and its discntents: a critical energy justice on four low-carbon transitions. *Climate Change 155*, 581-619.

Statista. (2021). *Unemployment rate in South Africa* . Statista.

Statista. (2022, September 7). *South Africa: social grants by recipients*. Retrieved from Statista: https://www.statista.com/statistics/1116081/population-receiving-social-grants-in-south-africa-by-province/

Stern, M., & Szalontai, G. (2006). Immigration policy in South Africa: does it make economic sense? *Development South Africa*, 123-145.

Strambo, C., Burton, J., & Atteridge, A. (2019). *The end of coal? Planning a "just transition" in South Africa.* Stockholm: Stockholm Environmental Institute.

Streimikiene, D., Kyriakopoulos, G. L., Lekavicius, V., & Siksnelyte-Butkiene, I. (2021). Energy poverty and low carbon just energy transition: Comparative study in Lithuania and Greece. *Social Indicators Research, 158*, 319-371. doi:https://doi.org/10.1007/s11205-021-02685-9

The World Bank. (2023). *Factsheet: Eskom Just Energy Transition Project in South Africa.* Washington DC: The World Bank.

Tomaszewski, L. E., Zarestky, J., & Gonzalez, E. (2020). Planning qualitative research: Design and decision making for new researchers. *International Journal of Qualitative Methods, 19*, 1-7. doi:10.1177/1609406920967174

UN. (2017, October 8). *SDGs 17 Goals to Transform Our World*. Retrieved from Global Urban Think Tank: http://www.urbanistes.info/sdgs-17-goals-to-transform-our-world/

UN. (n.d). *Ensure access to affordable, reliable, sustainable and modern energy for all.* Department of Economic and Social Affairs. Retrieved from https://sdgs.un.org/goals/goal7

USAID. (2016, July). *Greenhouse GAs Emissions in South Africa.* Retrieved from https://pdf.usaid.gov/pdf_docs/pa00msrg.pdf

Van De Merwe, W., & Brent, A. C. (2020). Evaluating the energy potential of solar PV located on mining properties in the Norher Cape province of South Africa. *Sustainability, 12*.

Wang, X., & Lo, K. (2021). Just transition: A conceptual review. *Energy research and social science 82*.

Williamson, K. (2007). *Exploring methods in information literacy.* New Wales South: Wagga Wagga.

Wood, G., & Baker, K. (2020). *The Palgrave handbook of managing fossil fuels and energy transitions.* Cham: Springer Nature Switzerland AG.

Zhu, E., Campbell, L., Hafner, M., Lu, X., Noussan, M., & Ralmondl, P. P. (2021). Towards an inclusive energy transition beyond coal-A comparison of just transition policies away from coall between China, the EU and the US. *Agricutural and Applied Economics*.

Exhibit 1.

Table 8: Reviewed literature in respect to energy transitions and employment

Author	Research problem	Population and sample	Research Gap
Khobai H and Le Roux P (2017)	The relationship between energy consumption, carbon dioxide (CO2) emission, economic growth, trade openness and urbanization for South Africa	South Africa	Policy makers should advocate more for renewable energy sources such as wind and solar in which South Africa has an abundance of.
Hanto J et al. (2021)	The impact of decarbonization on the energy system and related employment in South Africa.	Mpumalanga, South Africa	More study and work be done on specific measures such as restructuring strategies to promote economic growth and to make interventions real and doable.
Hägele, Iacobuţă, & Top (2022)	This research investigates how governments build and implement synergistic solutions to achieve	South Africa and Germany	The evaluation of SDG indicators and NDCs implementation in the context of a just energy transition to shed light on difficulties and successes.

	both international agendas concurrently.		
Rentier G et al. (2019)	Countries with a long history of coal mining and a considerable usage of coal for power generation face unique difficulties in achieving their climate targets.	Germany, Spain, Poland, and UK	Mitigating the obstacles of the implementation of phasing out carbon intensive technology.
Mertins H and Deshpande Z (2019)	Analysis on existing transition policies and beneficiaries thereof as well as the potential equity impacts of future policies to transition to a zero-carbon economy	Canada	Expanding of transition policies to apply to all workers including those who were historically excluded in the" old" economy.
Müller F and Claar S (2021)	Examining the extent to which a particular auction mechanism (the REI4P in the case of South Africa) may advance or jeopardize energy	South Africa	Redesign of the REI4P to cater for different regions

	justice and the possibilities for a just transition		
Sovacool et al. (2019)	Explore ways through which climate change responses can entrench, exacerbate of reconfigure the power of the elite.	South Africa, Malawi Bangladesh, Netherlands, and Mexico	In-depth investigation on who will unduly benefit from climate policy processes.
Moyo et al. (2017)	Relationship between renewable energy consumption on unemployment.	South Africa	Impact of renewable energy consumption on unemployment.
Axon S and Morrissey J (2020)	How energy transitions can lead to unintended consequences that result in social inequities for vulnerable and low-income communities	Stockbridge (near Liverpool), UK	Inclusivity of vulnerable and low-income communities in policy making for energy transition initiatives.

Bennett N.J et al. (2019)	Sustainability transformations cannot be considered a success unless social justice is a central concern.	Fisheries in British Columbia, Canada	Addressing the unequal distribution of transformative agency or increasing the ability of underrepresented groups to challenge and alter long-standing inequalities.
Heyen D.A et al. (2021)	Whether and to what degree EU environmental policy is socially just by using easily interpretable indicators	European Union	Produce policy outputs or response indicators to effectively measure the efficiency of the transition
Newel P & Mulvaney D. (2013)	Procedural and distributive justice aspects of energy politics and practise in relation to the just transition	Global	Robust governance to manage trade-offs between energy poverty, security and climate change that will emerge as a result of transitions
Annecke W. & Wolpe P (2022)	The extend at which current policies might serve as a mechanism and contribute to	Steve Tshwete Municipality-Mpumalanga	More policy and planning collaboration between levels of government and other key stakeholders including civil society, labour, communities, and industry

	mitigating negative impacts towards ensuring a holistic a just transition		

ANNEXURE 1

CONSENT FORM

Thank you for considering taking part in our research project. It is crucial that you understand the goal of the study, what participating would entail, and any possible risks or advantages before deciding whether or not to take part. Please carefully read this form, and don't hesitate to ask any questions you may have. You are free to discontinue participating in this study at any moment without repercussions as it is fully voluntary.

Researcher details: **Khantse Anna Tsukudu**

Organization: **Eskom**

Contact: **079 180 2683**

Study Purpose: *Investigating the impact of the Just Energy Transition (JET) on the employment outlook in South Africa.*

If you choose to take part, you will be required to respond to the best of your ability with regards to the topic at hand. The interview should take around 30 minutes to complete. All data gathered for this study will be handled with strict discretion. Your comments will be safely kept and anonymised. Any papers or publications resulting from this research will not include information identifying you personally. You have the right to voluntarily withdraw from this study at any moment without giving a reason. You are free to skip any question or stop taking the survey at any time without consequence or repercussion.

Although there might not be any immediate advantages for you as a volunteer, your input will help us better understand the impact the JET will have on employment in South Africa and increase knowledge in this area.

The data gathered for this study will be safely stored for 3 years. All information will be permanently removed or destroyed following this time frame. The research study's conclusions may be presented at conferences or published in scholarly journals. Your identity will not be revealed in any publication or presentation, though; it will remain a secret.

Khantse Anna Tsukudu should be contacted at any time if you have any questions or concerns about this study.

Name of Participant: _____

Individual's Signature: _____

ANNEXURE 2

INTERVIEW GUIDE 1

Climate change poses a great threat to humanity and as a result there is an urgent need to shift away from use of fossil fuels which account for a large portion of carbon emissions. The concept of "Just Energy Transition," is thus essential to address the climate challenge to ensure a sustainable and equitable future for all.

PART 1

1. Do you consent to this survey questionnaire?
2. Please select age category you fall under
    a. 21-35
    b. 35-55
    c. 55 and above
3. Please state the department you are employed in.
4. Please state your job title.
5. What are your roles and responsibilities in your current role?

PART 2

6. What do you understand by Just Energy Transition (JET)?
7. Were you adequately informed about JET and what it entails?
8. What were your initial thoughts when you were told about the closure of Komati Power Station in response to the JET?
9. Given the employment challenges, do you think it is feasible to implement the JET programme?
10. What were the consequences of Komati's closure?

11. Did the transition have an impact on your personal or professional life? If so, how?
12. What will alleviate your fears about JET?
13. Have you been equipped with the necessary skills for the new way of business?
14. How concerned are you about the possibility of job loss due to the transition? Elaborate.
15. Do you think the transition to clean energy will have a positive or negative impact on your job?
16. What opportunities do you see for your career as a result of the energy transition?

PART 3

17. If your current job were to be affected by the transition, what career changes would you consider?
18. What type of support would you like to see from ESKOM (government, industry etc).

Thank you for your time in completing the survey. Your answers will be sent to you upon request to verify if they have been captured accurately.

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ANNEXURE 3

Raw Data:

https://docs.google.com/file/d/11_z0SHAjrS60Bgj77XN3z7RJHu7A_YhB/edit?usp=docslist_api&filetype=msexcel

ESKOM Ethics Clearance:

https://drive.google.com/file/d/10iZa5uxLe226KziS4dJVN7mywiPQdcCt/view?usp=drivesdk

ANNEXURE 4

Activity	Date
In-depth interviews	5-31 December 2023
Data transcription	5 Jan 2024-10 Jan 2024
Data familiarisation	12 Jan 2024-18 Jan 2024
Data Coding	20 Jan 2024-23 Jan 2024
Theme development	23 Jan 24-30 Jan 2024
Triangulation	30 Jan 24-2 Feb 2024
Finalisation of report	21 Feb 2024-26 Feb 2024