

A Comparative Analysis of South Africa's Minerals-Energy Complex Before 2011
and the Current Pursuit of a Renewable Just Energy Transition post-2011 to 2023

By

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Abstract

This research traces South Africa's energy transition. It examines to what extent South Africa is on a just transition trajectory by comparing the minerals-energy complex and the current transition to renewable energy. It conducts this review of just transition through the lens of "equity" and suggests that "just transition" concerns equity or equitable distribution. It examines if South Africa is on a just transition by researching four dimensions of equity. The dimensions include (a) energy security, (b) the inclusivity of job creation, (c) redress for historical injustices experienced by vulnerable communities, and (d) broad-based empowerment initiatives. This is measured and deduced from the empirical review of the extent to which South Africa's energy sector has undergone or is undergoing a just transition. By systematically evaluating these dimensions, the research found that energy security can only be met if fairly distributed to all, avoiding the repetition of the minerals-energy complex structure which was biased against black people. The current renewable energy transition must ensure that the distribution of energy does not prioritise industrial companies but also supplies low-income households with affordable energy. South Africa's energy sector will need to diverge from the minerals-energy complex's narrow or enclave distributional structure. The sector will only be on a just transition if community protection and broad-based initiatives are mandatory targets to be met by private renewable companies (specifically Independent Power Producers). Lastly, stakeholder alignment is important for a successful just transition embedded in energy policies.

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Executive Summary

The main research question is, to what extent do the initiatives invested in the ongoing transition towards renewable energy exhibit a far-reaching, just (equitable) trajectory, in contrast to the efforts and potential for sustaining and enhancing the equity factor within the established minerals-energy complex energy structure in democratic South Africa?

In the context of South Africa's pervasive socio-economic inequality, this research seeks to examine the historical energy structure, characterised by the minerals-energy complex, and to assess its transition towards a more just and equitable trajectory. Given the nation's past, marked by severe disparities, this research places focus on the pivotal role of energy provision in shaping a more equitable South Africa. Understanding the intricacies of this transition is crucial, as the energy sector has the potential to act as a catalyst for social and economic transformation. By scrutinizing the evolution from the existing minerals-energy complex to a renewable energy-focused landscape, the research sheds light on the process and progress towards a just and inclusive energy trajectory, contributing to the broader narrative of placing 'just' before/with 'energy transition.'

This research deviates from the traditional dissertation structure. Instead of having a dedicated literature review chapter, the researcher seamlessly integrated literature into the background section and empirical chapter for a more cohesive narrative and analytical approach.

Chapter 1 is the introduction section that lays the ground for the purpose and research problem to be explored in this thesis. It further provides the method to be followed to execute this research to determine the extent to which South Africa is on a just transition.

Chapters 2 and 3 explore the complex terrain of South Africa's energy transition, scrutinising its 'just' nature by comparing the current renewable energy transition with the historically entrenched minerals-energy complex (MEC). The analysis spans four key dimensions: energy security, inclusivity of job creation, redress for injustices in vulnerable communities, and broad-based empowerment initiatives.

Chapter 4 undertakes a comparative analysis to determine the parallels and distinctions between the minerals-energy complex and the ongoing shift towards renewable energy. The aim is to assess the extent to which a just transition is unfolding in South Africa, considering the nation's pronounced socio-economic inequalities and the pivotal role of energy provision in fostering equity.

Chapter 5 provides key findings, recommendations limitations of the research and concludes the thesis.

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List of Key Abbreviations

Minerals-Energy Complex	MEC
Presidential Climate Commission	PCC
Black Economic Empowerment	BEE
Just Energy Transition	JET
Corporate Social Responsibility	CSR
Stated Owned Entity	SOE
Independent Power Producers	IPPs
Department of Energy	DOE
Broad-Based Black Economic Empowerment	BBBEE
Renewable Independent Power Producer Programme	REIPPP
Risk Mitigation Independent Power Producer Procurement Programme	RMIPPPP

Chapter 1

Introduction

South Africa is currently undergoing an energy transition, moving from fossil fuels as the primary source of energy, to accommodating renewable energy as part of the mix. This thesis argues, based on two events, that 2011 was the inflexion point of South Africa's policy efforts towards this direction. Firstly, in 2011 the South African government published the National Climate Change Response White Paper. This White Paper aimed to promote a "just transition to a climate-resilient and lower carbon economy and society" within the country (Connolly, 2022). As a result of this change, 102 IPP projects across four bidding windows starting from 2011 to 2015 were successful which enabled municipalities to diversify their energy sources, including solar, wind, hydro, and battery storage (ibid). Secondly, and related, energy initiatives as of 2011 began to embed just transition principles within targets to be met by renewable energy companies seeking to enter the energy mix – a notable change to soliciting a different behaviour from the private sector energy companies. As such, while the democratic era sought to transform South Africa's socio-economic landscape towards equitable distribution, it can be argued that the energy sector faced (1) an early democratic period of change, and (2) a later period of change. Is the inflexion point an improvement in the efforts of 'just' energy provision and participation?

This chapter sets out the background and context of just transition: where does it come from, what does it mean and how it is embedded within institutions? This background and context act as a backdrop to set out the problem statement of this research. The historical development of the just transition concept is pivotal to answering the research question and unravelling its evolution, significance, and global integration. Specifically, the research questions assess the extent to which South Africa was on a just energy provision trajectory between 1994 and 2011, compared to more pronounced efforts at effecting an energy transition post-2011 (to 2023). It examines this by embarking on a comparative review with the following set-up of periods. The first period is the pre-democracy period, which is the benchmark period that provides the origins and structure of energy provision in South Africa. The second period focuses on this inherited energy structure organised around the minerals-energy

complex between 1994 and 2011. Given the transition to democracy and efforts towards transforming the sector towards equitable distribution, is the current shift towards renewable energy since 2011 an improvement to the pre-2011 trajectory? This is a highly debated question, as not all stakeholders in South Africa believe that the unfolding transition offers an improvement in the prospects of realising 'just' participation in South Africa's energy sector. Some notable actors believe that the scope of a just energy provision lies in expanding the equity factor within the established fossil fuel-driven minerals-energy complex structure, while others argue for a transition towards a (renewable energy driven) JET (Connolly, 2022 & Swilling et al, 2016).¹

By minerals-energy complex, this thesis is referring to a system that dates to the 1870s when South Africa's economy accumulated its growth by depending on "cheap coal and cheap labour along racially oriented divisions for cheap electricity" (Phalatse, 2020 & Baker, 2015). This system "served national economic dependence on core mining and minerals-beneficiation sectors, and the interests of export-oriented industry" (Phalatse, 2020: p.10). By current transition to renewable energy, refers to the current transition in South Africa from fossil fuel which dominated the minerals-energy complex to energy generated from energy like solar, hydrogen and wind amongst others. It used the two periods to measure how 'just' is South Africa's energy transition through the lens of equity.

Before empirically measuring "just" through dimensions of equity, this thesis compares the institutional structures of the minerals-energy complex and the current renewable energy transition. Douglas North defined institutional structure as the arrangement of organizations and systems where institutions operate, implementing decisions and rules that govern their interactions (North, 1993). This framework informs the review of the four dimensions of equity used to assess "just." A comparative measurement of "just" would not have been possible without first understanding the historical context outlined in the review of energy institutional structures. The thesis comparatively reviewed the following four dimensions of equity which are defined in the background section and the research problem (see Table 1 below).

¹ This thesis uses MEC and JET as different energy and economic structure paradigms. However, it does this recognising that a transition towards renewable energy does not necessarily dismantle the systematic structure of the MEC.

Sen (2009) and Yin (2018) both viewed dimensions as a reliable method for analysing measurable aspects that define the key characteristics of an event or phenomenon. This research applies four dimensions, identified through literature, to assess the just transition in South Africa, examining the extent to which the country is undergoing this transition. The dimensions of equity include (a) energy security, (b) inclusivity of job creation, (c) redress for vulnerable communities, and (d) broad-based empowerment initiatives. These dimensions serve as the basis for evaluating the progress of South Africa's just transition, focusing on both the pre-renewable energy transition period and the current transition. By tracing these dimensions, this thesis makes a comparative assessment of South Africa's just energy transition, considering key players and the political economy. The research concludes with recommendations that contribute to the growing body of knowledge on energy transitions, policy formulation, and socio-economic transformations, as South Africa's policy space increasingly embraces the concept of a just energy transition as a central pillar of energy policy (Caromba, 2023).

Background and Context

Policymakers in the energy sector navigate the intricate balance between the competing interests of elites and powerful actors while safeguarding the livelihoods and energy needs of affected communities for the promotion of just transition. Haegele et al., (2022; p.89) delineate the inception of the just transition concept in the 1970s and 1980s, driven by labour unions advocating for workers' justice and environmental preservation. Tracing its origins to North America, the current understanding of just transition, integrated into South African energy policies, is underpinned by justice theories emphasizing fairness, equity, and trade-offs in rapid energy transitions (p.89). Originating as a response to strengthened environmental regulations in the 1970s, labour activist Tony Mazzocchi coined the term, recognizing the environmental benefits coupled with significant job losses in the United States' fossil fuel industries (Wang & Lo, 2021). Labour unions, instead of advocating for the repeal of environmental laws, championed just transition, emphasizing its interconnection with environmental concerns within the energy space, particularly the just energy transition. The primary goal was to mitigate mass unemployment, protect workers' livelihoods

during the shift from fossil fuels to low-carbon alternatives, and garner government support during this energy sector transition (Wang & Lo, 2021; p.2).

The implementation of just energy transition strategies initially focused on establishing social protection programs for workers and communities in hazardous industries. The core principle was to safeguard workers' rights and protect communities exposed to pollutive business practices. Although the concept gained traction in the 1990s, it faced limitations in the United States due to an anti-environmentalist political culture. In response, labour unions expanded their scope by aligning with global environmental negotiations. This international recognition led to the inclusion of just transition in the preamble of the Paris Agreement, urging governments worldwide to acknowledge the need for just transition, including South Africa (Lee, 2022). Haegele et al. note that the Paris Agreement addressed just transition and job creation, and the "Just Transition Silesia Declaration" signed by 50 countries at COP24 emphasized prioritizing workers' safety and creating decent jobs.

Gerrard (2015) reviewed Sovacool & Dworkin's work on global energy justice, framing just energy transition within the lens of "energy justice." Sovacool & Dworkin (2015) defined energy justice as the fair and *equitable* distribution of benefits and burdens associated with energy production within ethical considerations. They highlight global disparities in energy resources, emphasizing the health and environmental impacts on marginalized communities affected by energy-related problems such as pollution, lack of access to clean energy, and social inequalities. To evaluate energy policies within the framework of "energy justice," principles of accountability, historical responsibility, and stakeholder participation need to be observed. Further, Siciliano et al. state that energy justice ensures a participatory approach to decisions within the energy sector, prioritizing public interests.

After tracing the definition of just transition within the energy sector, "just" implies *equity* and equity under just transition refers to ensuring that the distribution of benefits and negative impact of "energy transition" is done fairly to different social groups and prevent vulnerable communities from being impacted. As deduced from above, social justice is also part of the energy transition, which looks at ensuring that different stakeholders are part of the decision-making process to ensure a democratic

participatory process. The creation of jobs and economic development is also an impact element of “just” under the energy transition, ensuring sustainable jobs and economic opportunities are created for communities/ persons affected by the transition from traditional energies to renewable energies.

Therefore, if just energy transition is backed by appropriate policies, its impact extends beyond environmental issues to address broad-based societal goals (Jakob & Steckel 2016; p.11). This includes redirecting economic rents created by natural wealth to social purposes and correcting societal imbalances. However, Jakob & Steckel caution that sufficient political power within society could block just transformation out of legitimate self-interest. They highlight instances, such as in Germany and Poland, where trade unions might resist energy transition fearing the potential abandonment of industries like coal. Haegele et al. researched just energy transition in Germany, finding that while progressive in phasing out coal, policies lacked strategies accounting for justice which led to the German Coal Commission implementing an inclusive approach through multi-stakeholder engagement, upholding procedural justice in the process of phasing out coal with appropriate social protection measures.

Critiques of energy policies argue that they lack clear strategies for effectively implementing a just energy transition (Sokołowski, 2022; Nel, 2015). While this critique is important, establishing a universal definition of a "just transition" could be problematic, as each country or region—such as South Africa—has its unique context that must be considered. This context is crucial for ensuring that sector-specific initiatives are effectively tailored to local needs. Nel (2015) supports this view, noting that transitioning from traditional fossil fuel industries to clean energy can be challenging, particularly when it comes to ensuring a fair distribution of benefits among diverse stakeholders. Moreover, communities often have limited influence over "just transition" strategies, which can lead to inequitable outcomes, potentially conflicting with economic priorities and resulting in job losses (Nel, 2015).

The evolution of just transition has reached South Africa, with Haegele et al. noting the ongoing implementation of Just Energy Transition amidst the country's high reliance on coal for electricity, a result of the minerals-energy complex which refers to the reinforced relation between the extraction of mineral resources and energy

production shaping the political and industrial economic development of a country (to be discussed in detail in chapter 2). The South Africa National Framework for a Just Transition defines it as contributing to a quality life for South Africans, combating adverse climate impacts, and achieving net-zero gas emissions by 2030. It emphasizes placing people, especially the most impacted - the poor, women, people with disabilities, and the youth, at the centre of decision-making, equipping them with new opportunities (JET IP; 2022, p.28). Winkler (2020) states that just transition in South Africa emphasizes resolving societal issues such as poverty and inequality based on the dominant historic and current economic structure of the country. Therefore, the historical development and global integration of the just transition concept provide a critical backdrop for examining its implementation and impact in the unique context of South Africa for this research.

It is because of the history of companies in South Africa, that energy initiatives as of 2011 have embedded just transition principles discussed above within targets to be met by renewable energy companies seeking to enter the energy mix. These targets are met by companies through initiatives that are embedded in corporate social responsibility ("CSR") targets which is what has led to the evolving nature of modern companies globally but also in South Africa. As such, a review of CSR and just transition go hand in hand. CSR originates from the stakeholder theory introduced by Edward Freeman in 1984. It assumes that companies balance ethics and sustainability with profits as their core fundamental, transcending the traditional focus on shareholders and recognizing the broader value generated by successful companies. External governance, which entails a broader perspective on corporate governance, emphasizes the control exercised outside the company. It acknowledges the role of parties like the government in delegating functions to companies, affecting their responses to internal and external stakeholders. Corporate responsibility, therefore, aims to hold companies accountable for any negative effects sustained by stakeholders due to the company's conduct, emphasizing the need for proper corporate governance that considers stakeholder interests while ensuring profitability for long-term sustainability.

The challenges faced by most companies, including the ability to be "responsible corporate citizens," emphasize the need for a balanced approach that fulfils societal

responsibility while ensuring economic development and profitability. Leveraging Freeman's Stakeholder Theory, Lock and Seele (2017) advocate for sustainability as the central unifying focus around which societal actors converge. Stakeholders, including government entities, corporations, media organizations, private citizens, and non-governmental organizations (NGOs), share a vested interest in shaping a collective future grounded in sustainability.

Renewable energy companies are seen as key actors in effecting a just transition in South Africa, as the renewable energy mix brings new players into a previously minerals-energy complex institutional structure. Their role in contributing to an equitable transition is seen through sustainability initiatives where companies embed targets that include local and skills development, to contribute to job creation, enhance the capabilities of the local workforce, and align with corporate social responsibility goals related to supporting the communities in which the modern renewable companies operate (see table 1 below).

Table 1 South Africa's Just Transition Criteria related to Corporate Social Responsibility

Elements of Economic Development	Description
Job Creation	<ul style="list-style-type: none"> - Black Employees - South African-based employees - Employees from the local communities.
Preferential Procurement (Broad-based economic empowerment initiatives)	<ul style="list-style-type: none"> - SME contractors - Women-owned contractors - Empowerment Contractors - Broad-Based Black Economic.
Ownership (Redress for historical injustices)	<ul style="list-style-type: none"> - Local communities - Value spending to the local economy - Shareholding to be held by black people - Black people in top management. - Black people in construction and operations contractors.

Eberhard & Naude (2017)

Table 1 highlights summarized criteria for economic development in South Africa to be met by private companies (specifically Independent Power Producers “IPPs”) when bidding to be awarded tender or projects that will generate electricity from renewable energy. These criteria, if met, would potentially place South Africa on a just renewable energy transition. It is, however, not obvious that these criteria are being met, given the history of the private sector in South Africa’s long-standing minerals-energy complex rents space, and the temptations of managing (transformation) rules through corruption. The above criteria did not mention “energy security” as an economic development criterion. This thesis found it imperative to review energy security as a key equity element. The first equity dimension is the assurance of *energy security*, under this equity dimension this research considers the capacity of energy distribution and to whom the energy distribution benefits (this encompasses affordability and physical access). The *inclusivity of job creation*, which looks at the question of the extent of job creation, focuses on both unskilled and skilled, in terms of race and gender. The *redress for historical injustices* experienced by vulnerable communities that are adversely affected by the operation of minerals energy companies and renewable energy companies. Affected communities for this thesis refer to any adverse effect that does not consist of the definition of just transition and equity (defined below) experienced by villages, towns, and any setting area with people near a mining area owned by mining companies. Broad-based *empowerment initiatives* refer to integrating *previously disadvantaged individuals* (such as black people and black-owned companies) into the industrial value chain through local content or economic empowerment policy initiatives.

Research Problem

South Africa stands at a pivotal period in its energy landscape where historical energy use has led to an energy crisis seen by frequent power cuts with economic, social, and political implications (Caromba, 2023). As such, these power cut cases have introduced a call for an energy mix that will provide stable and clean energy to South Africa given its historical energy mix (fossil fuel) based around the minerals-energy complex. The minerals-energy complex is not only an energy structure and a path of industrial development but a political economy theory that explains the appropriation

and distribution of rents and benefits that rest in its energy mix. As such, this research comparatively explores the trajectory of just energy during the minerals-energy complex compared to the current renewable energy transition in terms of *equity* in South Africa. That is, what progress was made during the earlier years of democracy to transform the minerals-energy complex towards a just trajectory through the four dimensions of equity? Secondly, to what extent is just transition taking place during the current renewable energy transition measured through the four dimensions of equity? This research employs a comparative design, between the minerals-energy complex period, and the just energy transition period, mainly since the democratic era.² From a timeline perspective, this research sought to understand if there appears to be a divergence relative to the incumbent minerals-energy complex, from an equitable distribution perspective, using the four dimensions.

By systematically evaluating these dimensions, the research addresses industry imperatives in how just transitions can be embedded as a market fundamental in South Africa. This research addresses this with recommendations for energy actors to ensure South Africa achieves a seamless and socially equitable shift towards sustainable energy practices. Reviewing and addressing complex historical energy structure becomes important for understanding the nature and trajectory of South Africa's pursuit of a just energy transition, bringing forth caution for effective backwards and forward policy initiatives that effectively shape the nation's energy policies and socio-economic landscape for years to come.

Research Question

The research question is: To what extent do the initiatives invested in the ongoing transition towards renewable energy exhibit a far-reaching, just (equitable) trajectory, in contrast to the efforts and potential for sustaining and enhancing the equity factor within the established minerals-energy complex energy structure in democratic South Africa?

² By distinguishing between the MEC period and the JET period, the study does not suggest that South Africa has shifted away from the MEC structure. This study uses the language to distinguish between what could be viewed as two energy policy periods, with the latter period beginning to accommodate renewable energy and an eventual transition away from fossil fuels as the primary source of energy.

The following sub-questions were utilized to answer the extent to which the current renewable energy transition in comparison to the minerals-energy complex in South Africa undergone a just energy transition:

- To what extent was South Africa on a just energy trajectory during the minerals-energy complex industrial development pre-1998, and between 1998 and 2011?
- To what extent has the current renewable energy transition undergone just transition between 2011 and 2023?
- To what extent is the policy change that opens space for IPPs, and the subsequent entry of IPPs, align with creating a transition that is “just”?

Research Methodology:

This research employed the analytical narrative approach, a qualitative method for collecting and analysing non-numerical data, recommended for social sciences research on development policy and practice (Bates et al., 1998; Levi et al., 2016). The approach involves constructing a narrative to explain an identified problem in a specific research, utilizing an iterative process that blurs the lines between inductive and deductive analysis (Kuhn & Lakatos, 1970, p.16-17). It includes generating and testing a concept or theory, disciplining the narrative against the concept or theory, modifying it based on empirical testing, and post-diction to explain the phenomena studied. This approach was applied by Martin & Morris (2015) who utilized the analytical narrative approach to research the political economy of climate change policies. Martin & Morris utilized the approach to review the periodic arena of renewable energy being introduced in South Africa amidst Eskom’s coal reliance and dominance.

The chosen research design is comparative, focusing on two distinct periods to deduce findings that address the research question of to what extent is South Africa in a just transition. This research design studies the same research question in two social issues through a comparative lens, identifying similarities and differences to arrive at findings (Bryman & Bell, 2014). The research question is addressed using a

qualitative analytic narrative data collection method, drawing narratives from journals, documents, and other sources. This desk-top method utilizes publicly available sources to account for outcomes by identifying mechanisms that generate them (Bates et al., 1998, p.12). This method is more viable given the length of the research's chosen periods and the newness of the concept of just transition within South Africa's energy space.

Data collection involves process tracing, and analysing evidence available on processes, sequences, and events in a case to develop or test the research problem on causal connections (Levi & Weingast, 2016). This method complements the analytic narrative approach, focusing not only on key players but also on key dimensions instead of variables, interactions, and strategies. The data analysis method includes narrative analysis, employing rational selection to move from description to explanation (Delve et al., 2020). This involved reviewing public and organizational documents and mass media outputs. The data is presented through tables, figures, and network diagrams, providing a visual representation of the narrative in matrices. Through the dimensions of equity that direct the collection of information that contributes to or guides the research question. Variables could have been utilized for this research if the method were quantitative. However, this would have limited the research to specific measurements whilst dimensions allow for this research to trace broader aspects of the just transition. Phalatse (2020) similarly to this research, instead of variables, applied dimensions to trace Eskom's crisis and the energy reform. By measuring the research question through dimensions, Phalatse's research was able to establish how Eskom's crisis is based on financial mismanagement and unsustainable debt levels, corruption, and global coal prices.

Definition of Key Concepts:

Just refers to actions that are fair and morally sound which implies *equity* (Merriam-Webster, 2024).

Equity under just transition refers to ensuring that the distribution of benefits and negative impact of "energy transition" is done fairly to different social groups and prevents vulnerable communities from being impacted (ibid).

Just Transition has been defined by the “African Development Bank” as the way to improve the lives of ‘the most vulnerable while building low-carbon, resilient economies. Further, addresses societal, economic, and environmental issues (Otlhogile et al., 2023; p.3).

Just Energy Transition refers to a ‘transformation of the energy sector from fossil-based to zero-carbon to limit severe climate change as it focuses on energy sectors, both upstream and downstream, to secure workers’ rights, to provide social protection for affected workers and communities, to remove barriers to integrating fossil fuel workers into clean energy sectors, and to build the necessary workforce capacity to deliver clean energy goals. It is often expanded to include delivering universal, reliable, affordable energy access” (Otlhogile et al., 2023; p.3).

Energy Security refers to the availability or adequate supply of energy sources.

Industrial Policy refers to a country’s strategy to promote economic development and growth.

Minerals-Energy Complex refers to “a set of core sectors that include mining and electricity and manufacturing subsectors including gold, iron, steel.” These sectors (that focus on energy production) become intertwined to the extent in which they determine the trajectory of economic and political dynamics of industrial development (Bell & Farrell, 1997; 591-593).

Industrial development refers to the economic efforts to enact social development to improve the well-being of persons, companies and local communities through socio-economic initiatives set in policy goals.

This chapter has provided a background introducing just transition and leads to a research problem that borrows from the context to effectively research the extent to which just transition is being realised.

Chapter 2

Empirical Review of the trajectory of the Minerals-Energy Complex towards equitable distribution

This chapter undertakes an empirical review by process tracing the minerals-energy complex between pre-democracy (1860s to 1998) and during the first one and a half decades of democracy. This process is conducted by reviewing and introducing the theoretical framework of the minerals-energy complex, where it comes from, what structure it sets, what it means and why it matters to this research. It details South Africa's institutional structure before 2011 and studies the four dimensions of equity which include energy security, inclusivity of job creation, redress of injustices experienced by vulnerable communities and broad-based empowerment initiatives. Through the review of literature including journals, it highlights how the energy sector was structured in a way minerals resource-focused institutions dominated the energy sector to an extent that dictates the direction of the economy, labour generation and the political economy. This research follows the actions or inactions of companies that dominated the minerals energy sector and traces initiatives that sought to enact equity to correct the consequences of the minerals-energy complex. This evaluation is imperative to determine to what extent South Africa was on a just energy trajectory during the minerals-energy complex industrial development.

Minerals-Energy Complex Framework Origin & Institutional Structure before Democracy (1860s to 1998)

South Africa's minerals-energy complex, as conceptualized by Fine & Rustomjee (1996), unfolds across the late 19th century, the colonial era, the apartheid regime, and into the contemporary period. Rooted in industrial policy decisions favoring electricity, mining, and fuel suppliers, it profoundly influences the nation's energy policy, centered on mineral resources like coal, platinum, and gold (Winkler, 2020; p.4). Fine and Rustomjee (1996) see it as a network of interactions between public and private sector institutions, the minerals-energy complex significantly shapes South Africa's political economy (Hlongwane, 2014; p.35). It functions as an accumulation system concentrating on creating, appropriating, and distributing rents within the

minerals and energy complex (Fine and Rustomjee; 1996, p.5), fostering interdependence and linkages among sectors (Hlongwane, 2014; p.37).

The minerals-energy complex's emergence is tied to the discovery of minerals, particularly coal, which became pivotal to South Africa's economy. Early investments in mining and labour migration laid the groundwork for its dominance, with the mining industry playing a crucial role in the nation's economic structure. Freund (2010) highlights that the mining sector's discovery of vast mineral resources led to a heavy reliance on mining activities, sustained by laws promoting unfair labour practices. The growth of the coal mining sector responded to the increasing electricity demands in South Africa. Newman (2019) delves into the complex, exposing its profound influence on the nation's economic structure and patterns of inequality. During apartheid, it played a vital role in shaping economic policies, resulting in racial imbalances, exploitation of black labour, and social unrest, prompting the need for a just transition trajectory in minerals energy. Industrial policies, crucial for economic development, were significantly influenced by elite interests, stemming from the historical disconnect between economic and political power since 1948 (Newman, 2019, p.12-13). These disconnects shaped policies favoring state-owned projects heavily dependent on mining inputs, including energy, aligning with companies like Eskom. By 1988, approximately 83% of the market capitalization was collectively owned by six diversified conglomerates, emphasizing the concentrated economic power within the minerals-energy complex (Newman, 2019).

This economic power aligned with global investment interests (Wilson, 2001: p.101). Diamonds first led to industrialization, with a subsequent focus on gold, particularly from Witwatersrand gold mines, leading to the employment of miners (p.101). Within two decades, gold constituted two-thirds of the country's exports (ibid). Wilson (2001) notes that during the 1980s, gold mines in South Africa produced "one-half and two-thirds of the world output and generated 40% and 50% of the country's exports" (p.102). Like coal mining, gold spurred an interconnected industrial trajectory, dominating the economy through exports, with labour dependent on gold mining and stimulating various economic activities. This was from coal mining to agricultural production or tax revenue, as detailed in Figure 1 below, where South Africa's gold

mining was at the center of exports, employment, and government revenue (Wilson, 2001: p.101).

Figure 1: South Africa's Gold Mining from 1911 to 1999

Table 1. Gold Mining in South Africa: 1911–1999

Year	Output fine kg. (thousands)	Contribution to world prdn. (percent)	Contribution to govt. revenue (percent)	Contribution to GNP (percent)	Contribution to exports (percent)	Total employment (thousands)	Avg. value per fine oz. (Rands) (U.S.\$)	
1911	257	37	7	20	64	215	8.5	-
1921	253	51	9	13	63	194	10.7	-
1931	338	49	12	16	69	233	8.5	-
1941	448	37	42	18	n.a.	410	16.8	35
1951	358	45	14	10	36	343	24.8	35
1961	714	65	10	10	40	448	25.1	35
1971	976	78	5	6*	n.a.	417	28.6	41
1981	658	67	26	11*	46	479	402.6	460
1986	640	49	n.a.	10*	n.a.	534	837.3	368
1991	599	34	1	5*	30	424	997.9	362
1996	495	n.a.	n.a.	4*	n.a.	342	1664.0	388
1999	449	n.a.	n.a.	(2*)	n.a.	222	(1623)	(294)

Notes: Figures marked with an asterisk refer to gross domestic, rather than gross national, product. Total employment measures the average number of persons in service during the year. Figures in parentheses are for 1998. In December of 1932 South Africa abandoned the gold standard; in January of 1933 U.S. President Roosevelt devalued the dollar and set gold at \$35 per fine oz. Before that time the relevant price of gold for South Africa was set in sterling rather than dollars.

Wilson (2001, p.102)

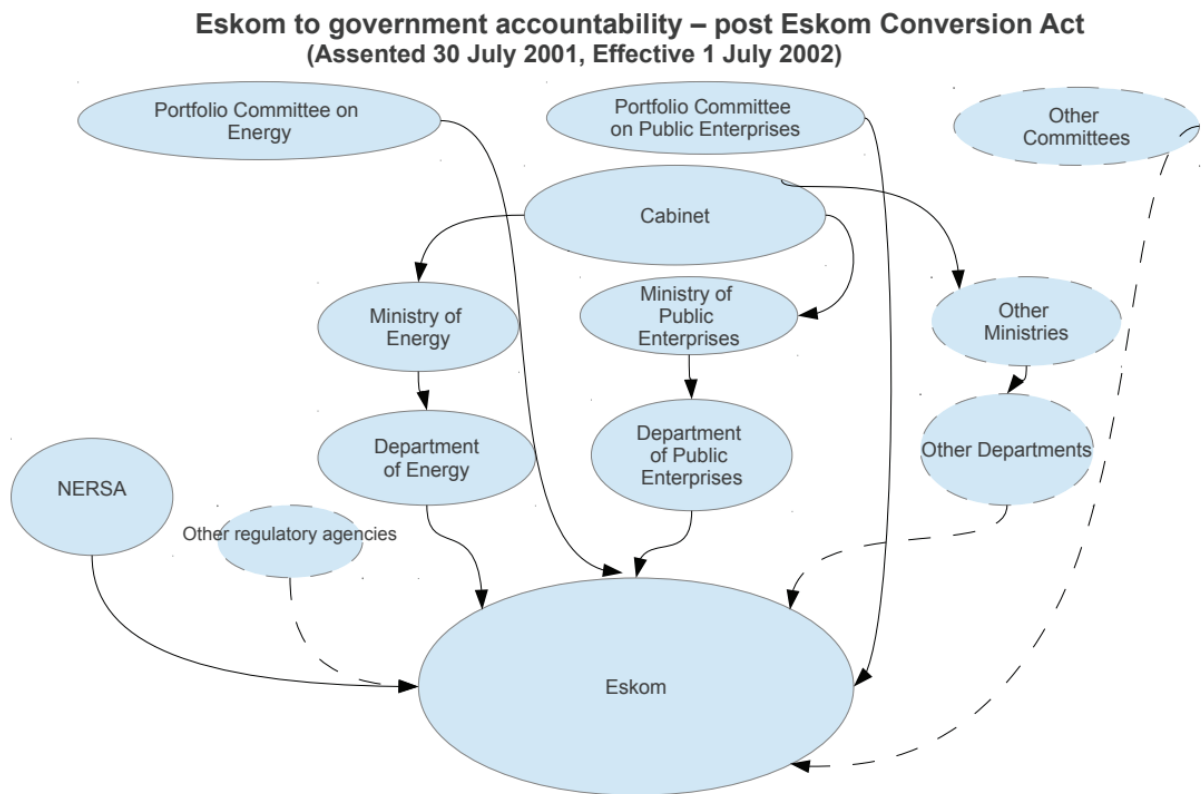
However, gold was not the only primary mineral resource, diamonds were discovered in 1867 which provided a lot of the early capital (Wilson, 2001). Wilson states that this led to high economic growth with 5% and 6% of “real production” increasing annually, employment growth outstripped ‘the population and average per capita income increased steadily’. The advent of democracy in 1994 led to South Africa's transformative journey, with economic policies aiming to reintegrate the nation into the global economy. Despite this shift, the legacy of the apartheid-era mineral-energy complex persisted, as noted by Newman (2019, p.3, p.11). The mineral-energy complex, existing since the 1970s, maintained stable "direct forward and backward linkages" within its subsectors, albeit in relative isolation from non-minerals-energy complex sectors, particularly labour-intensive consumer goods manufacturing.

Minerals-Energy Complex Framework and Institutional Structure in Early Democracy to 2011

The legacy of the minerals-energy complex continuously formed part of South Africa's energy history and its direction even under a democratic political dispensation. Amongst other factors, Eskom's inability to navigate restrictions to charge market rates for electricity and the lack of focused market strategies led to its progressive failure (Woode-Smitte, 2019). To bring effective change to the dominance of Eskom and correct the history, the South African government responded by enacting and enforcing measures that sought to strike a delicate balance between the economic advantages offered by the energy companies and the need for environmental sustainability and social equity within the electricity market. This endeavour was part of the initiation of the Reconstruction and Development Program ("**RDP**"), signifying a proactive step toward effecting change, including affordable electricity especially to the "previously excluded population" (Phalatse, 2020). RDP was a national policy that sought to integrate socio-economic initiatives, part of which increased electricity supply and access to different households by 70% in 2004 (van der Heijden, 2013; Phalatse, 2020).

Notwithstanding, progress in the realm of *energy mix* discussions was slow. In 1998, the South Africa White Paper on the Energy Policy recognised that the electricity sector relied on coal which has various impacts including pollution (p.41). Further, it sought to unbundle and introduce renewable energy companies. However, the 1998 White Paper did not recognize the need for just energy transition in express terms. According to Phalatse (2020), electricity continued to maintain "the architecture of the minerals-energy complex" institutional structure (p.14). In 2000, 44% of electricity was consumed by the "Energy Intensive User's Group" which had 36 members such as mining companies seen under the MEC including BHP Billiton and Anglo American (Phalatse, 2020). Additionally, Eskom had key actors that were government-focused because of its state-owned enterprise status, as a result, any change driven was dependent on the key players' support and political will (see figure 2 below).

Figure 2: Eskom's Key Players in 2002



Van der Heijden (2013; p.32)

Even at the dawn of the 2010s decade, Eskom, the national power utility created by the minerals-energy complex, remained a central player, continuing to dominate the electricity market by generating a staggering 95% of South Africa’s electricity and 45% of Africa’s electricity market. This dominance was evidenced by Eskom's role in generating, transmitting, and distributing electricity to a diverse range of sectors, including industrial, mining, commercial, agricultural, and residential customers. This resulted in a limited shift from the minerals-energy complex, during this period the implications of the minerals-energy complex remained in place. Further, in agreement with Ting & Byrne (2020), Eskom’s position shaped the policy landscape, contributing to policy uncertainty as it remains the “vital instrument in the state’s policy directives and seen as the vanguard of economic development”.

This section has traced the origin of the minerals-energy complex and how it has structured the energy sector to the extent that all the energy sectors were dependent on electricity generation. This led to economic power and industrial growth of the country dependent on the electricity sector. The minerals-energy complex framework and its structural overview assisted the research and empirical review of the four dimensions of equity, specifically the extent to which the negative impact of the minerals-energy complex affected just transition aspects through the lens of equity. The essential part of this section is to link directly how the institutional structure set by the minerals-energy complex directed the trajectory of the societal systems. Such institutional structure becomes imperative to trace and form an analytical narrative of the status of equity under this energy complex.

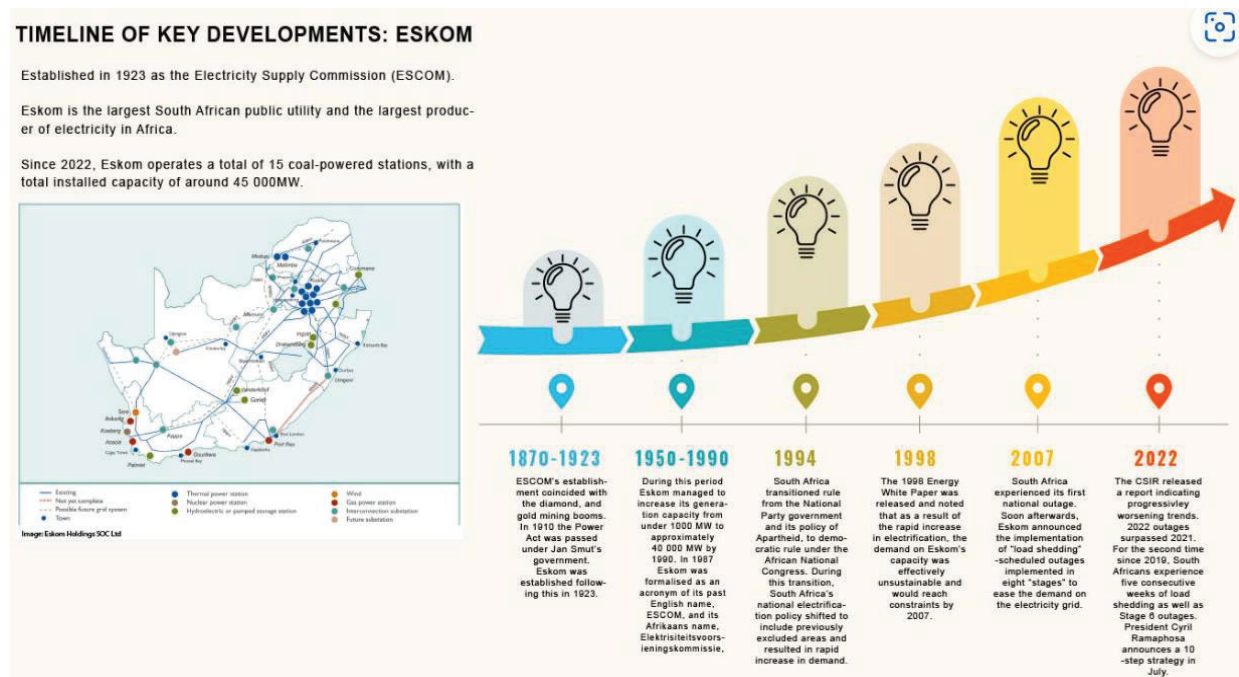
First Equity Dimension: Energy Security Under Minerals-Energy Complex

Initially, the minerals-energy complex primarily entailed the interconnectedness of electricity and coal mining. However, it subsequently expanded to encompass intricate relations between electricity, mining conglomerates like Anglo-America, mineral beneficiaries, and industries reliant on crude oil and coal, such as petrochemicals (Baker, 2015; p.249). These sectors exerted considerable influence over state policies and the trajectory of the South African economy, particularly during the apartheid era and its aftermath. A cornerstone entity within the minerals-energy complex is the vertically integrated monopoly, Eskom, which held market dominance within South Africa's electricity sector (see figure 3 below which summarizes Eskom's history from 1870), while coal mining is controlled by corporate giants such as Anglo America, BHP Billiton, Sasol, and others (Baker, 2015).

The minerals sector significantly propels the energy sector, forming a dual dependence essential for both domestic consumption and export markets (ibid). Additionally, it asserts that the sectors comprising the minerals-energy complex were under the sway of economic and political elites who, during the apartheid regime, wielded substantial influence over government policies, effectively moulding them to favour the interests of those holding economic power (ibid). Eskom maintained tight-knit connections with mining corporations during apartheid, significantly influencing

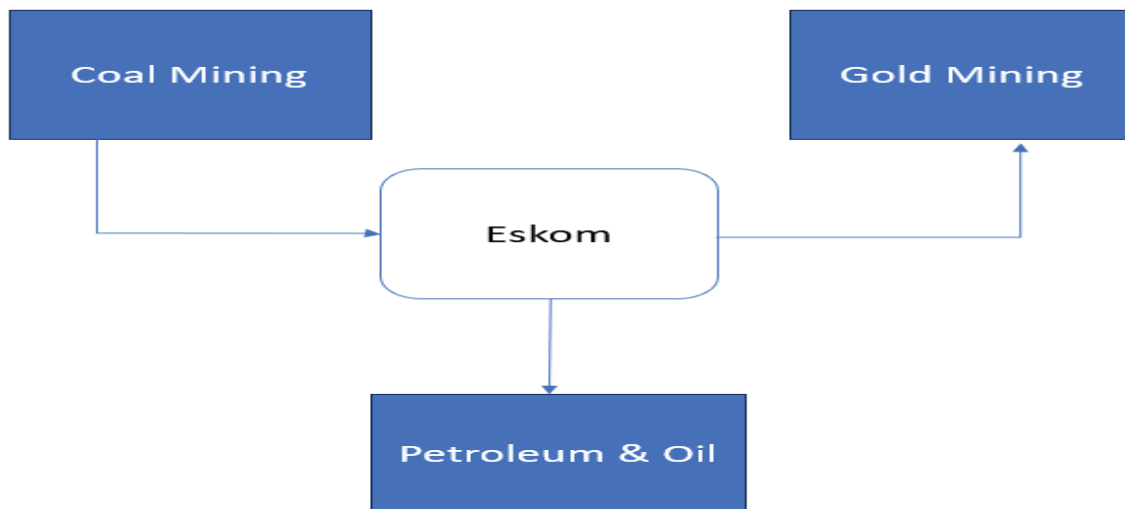
coal procurement and its utilization for power generation. See Figure 4 below where Eskom was dependent on coal while meeting gold mining and other minerals (such as oil) electricity demands. The political backing resulted in Eskom becoming a cornerstone of the government's support system, securing crucial financial aid and regulatory endorsements. The presidency of PW Botha (1978-1984) marked a pivotal period when coal mining received substantial governmental support. Botha championed economic policies that intricately intertwined the coal mining industry with energy distribution, foreseeing it as a stabilizing force politically and economically. However, as Mirzania et al. (2023) state South Africa has a history of social and environmental injustices after the end of societal oppressions such as the apartheid, “fossil-based energy system and lack of environmental governance have prolonged issues of poverty, inequality, and pollution” (p.3). This led to secure electricity distribution being solely enjoyed by industrial, commercial businesses and “all white households including remote farms” with the exclusion of black informal settlements and townships (Baker & Philips, 2019).

Figure 3: Key Developments of Eskom



Siyobi & Moosa (2022)

Figure 4: Eskom's Connected Structure Pre-1998



Source: Author

In the 1920s, South Africa's landscape saw a great demand for electricity supply that could support railways, minerals-based sectors, and industrial growth (see Figure 4 above). For energy security in South Africa during the minerals-energy complex, major cities were connected to supply electricity during the 1890s. This meant a stable and reliable energy supply dependent on domestic minerals resources on low-grade coal reserves and by the 1970s the transmission grid was under the state's control through Eskom (Van der Heijden, 2013: p.4). The 1970s oil crisis saw South Africa's economy increase its reliance on electricity as the primary source for the supply of energy for all sectors as market demand for electricity grew. This led to Eskom being under pressure to meet demand (Van der Heijden, 2013: p4). In the 1940s gold mining held 59% of electricity consumption in 1948 coal mines owned by Afrikaans persons exported coal instead of deploying it for domestic consumption because of competition amongst "Afrikaner nationalist interests and British imperial mining interests" (SAHO,2023).

As gold mines expanded, the market competition led to power shortages or what was called "consumption reduction" from 1948 to 1953 which led to Eskom building the most developed coal plant to meet the great demand that increased its capacity (SAHO, 2023). In the 1990s Eskom began to sell "low-cost electricity contracts to energy-intensive users" which included minerals-beneficiation investments such as aluminium and further contracts with Anglo America and BHP Billiton (ibid). Energy

distribution during this time was heavily concentrated in conglomerates within the minerals-energy landscape with labour being exploited to meet this demand. The formation of Eskom made a key change in electricity generation by supporting coal mining and sectors that benefited from energy consumption. The Coal Act of 1934 regulated the coal industry primarily addressing issues of distribution and pricing to ensure a sustained supply of coal which was part of the minerals-energy complex. The Cheap Electricity Policy in line with the Energy Regulation Act of 1943 played a role in shaping the minerals-energy complex by establishing a regime that dictated cheap electricity was key to ensure industrial growth and allowed for government intervention to promote distribution of energy resources including the mining sector.

There is limited evidence of energy policies directly addressing the imbalance in energy distribution and advocating for change. However, economic pressures highlighted the need to correct the energy bias and its discriminatory impacts (Kamanzi, 2021). In 1941, these pressures led to the formation of the “Council of Non-European Trade Unions” and the involvement of the African Mineworkers Union (AMWU), which had strong ties to the African National Congress and the Communist Party of South Africa (p.10). This movement aligned with the push for a national electrification scheme, which gained momentum in the 1980s and 1990s (p.15). In 1985, local authorities were reorganized under the Regional Services Councils to manage public services. However, these services were divided along racial lines, reflecting the apartheid policy of “separate development” (p.13). While the government established structures like the “Black Local Authorities,” these lacked adequate funding and were unable to effectively address the need for electricity access in black communities. In 1990, the “Electricity for All: The Need and the Means” proposal was introduced, calling for the National Electrification Forum to prioritize national electrification as a key development goal.

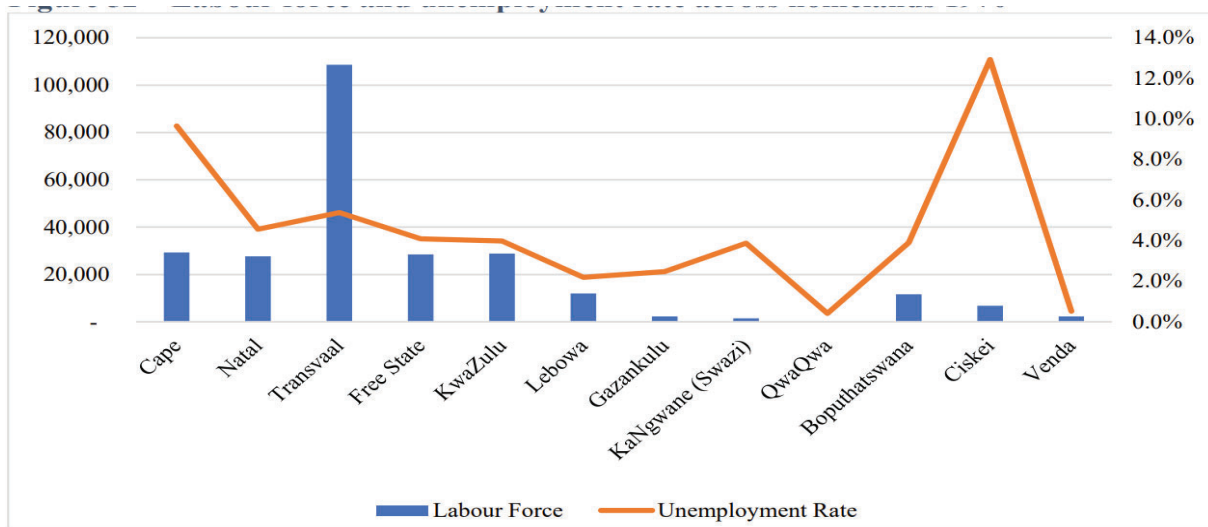
Second Equity Dimension: Inclusivity of Job Creation Minerals-Energy Complex

The creation of labour during the establishment of the minerals-energy complex was crucial for energy distribution. In the eras of colonialism and apartheid, the structures supporting the minerals-energy complex were primarily influenced by laws rather than

energy policies. Key legislations shaping labour relations in the mining sector include the Mines and Works Act of 1911 and the Industrial Conciliation Act of 1924. The Mines and Works Act sparked labour issues by preserving skilled jobs for white workers, leading to racial inequality as black individuals were relegated to underground mining roles. By the 1950s, ESCOM, the electricity supply company, employed 13,000 workers, with salaried positions exclusively reserved for white workers (SAHO, 2023). Wilson (2001) argues that during this period, job opportunities for black miners were clearly defined, creating a power structure that favoured white workers. Around 1913, labour unions began questioning the disadvantage faced by black miners, leading to public strikes in 1914, 1920, and 1946. It was only in 1980 that mining companies, and the South African state granted black miners the right to collective bargaining through the National Union of Mineworkers, led by Cyril Ramaphosa.

Unfair labour practices were prevalent not only in gold mines but also in coal mines. With the rise of coal-powered plants as the primary source of electricity, the Coal Act of 1944 played a key role in regulating the quality, safety standards, and pricing of coal (Freund, 2010, p.18). Major coal mining companies, such as Anglo-American, were instrumental in supplying coal to power stations, forging strong relationships with political elites from the National Party. This close alliance helped shape economic policies and reinforced racially segregated workplaces, contributing to significant workforce disparities and environmental harm. The minerals-energy complex, which relied heavily on a large labour force for tasks like transportation and energy supply, further entrenched these inequalities. Labour dynamics within the complex were skewed in favour of urban centres, leaving rural areas largely neglected. Moreover, workers within the minerals-energy sector faced low wages, poor working conditions, and widespread discriminatory practices in employment.

Figure 5: "Labour Forces and Unemployment Rate Across Homelands in 1970"



Data source: Statistics South Africa census 1970

Nxele (2023; p.312)

In the 1920s, black South Africans acquired significant land containing valuable "platinum group metals" (Nxele, 2023, p.313). However, mining these metals proved costly and required specialized extraction techniques, which made it difficult for locals, who lacked the necessary skills and capital, to engage in mining activities at the time (Ibid). By 1979, 59 mines were operating on land owned by black individuals in the homelands, employing over 12,000 black mineworkers (Nxele, 2023, p.314). The Mine and Works Act explicitly defined the roles assigned to black workers, reinforcing the discriminatory nature of the industry. As a result, wage disparities were stark, with white mineworkers earning R350 per month compared to only R100 paid to African mineworkers in 1979 (Nxele, 2023, p.314). Figure 5 above highlights this inequality, showing the disproportionately low employment rate for black workers, with most being employed in regions such as the Cape, certain areas of Natal, and Transvaal (Ibid)

Eskom's initial reliance on coal and cheap labour led to relative success, but mismanagement and rising labour costs affected its performance. Its full monopoly status in 1948 resulted in struggles to meet electricity demands in the 1950s. Woode-Smite critiques Eskom's strategy of maintaining business operations while constrained by its monopoly status. Institutions during periods like apartheid or colonialism saw

business insiders, whose investments and skills were concentrated in capital-intensive sectors, and formal employees, black by 1994. The labour aristocracy of insiders reproduced past inequalities, lacking economic incentives to change. Institutions intricately linked to politicians resulted in decision-making patterns that disproportionately favoured unionized blue and white-collar workers at the expense of those outside the formal economy (Levy et al., 2021, p16). As South Africa entered the progressive era, labour unions, in negotiations, sought rights for fair labour practices and wages for black individuals. The African National Congress and its intra-elites had to accommodate trade union requests to establish equality before the law. Considering the state of the minerals-energy complex shaping South Africa's energy landscape, trade unions, particularly within the mining industry, advocated for social justice and equality (Wilson, 2001, p.108-109).

Third Equity Dimension: Redress for injustices experienced by vulnerable communities:

By the period of 1979, mines were not locally owned and benefited persons outside the exposed vulnerable communities (ibid). Nxele (2023) states that during the colonial period and apartheid regime some minerals such as diamonds during the late 1800s to mid-1900s exploited and oppressed black people in South Africa (p.304). The mining industry had emerged as the primary contributor to South Africa's wealth, but this economic contribution soon resulted in the impoverishment and division of disadvantaged communities, particularly black communities (Llewellyn, 2018). Land ownership and mining community trusts, designed to benefit politicians, traditional leaders, and businesses, often lead to further disparities and the capture of resources for personal gain. Several areas became host to large mineral sources like platinum, copper, gold etc. Local mining communities that have been affected by closing or downscaling since 1852 have been almost 36 which also affected the employment rates of the local persons (Cole, 2020: p.962). This includes Northern Cape copper areas, Gauteng gold mines and coal mines in KwaZulu-Natal (p.962). Mine closure resulted in mine workers being retrenched and financial suffering experienced by the workers, families, and local businesses. Cole (2020) found that above 41 host communities have a population above 1.3 million people that are “mining towns” and

pre-existing villages or towns in the platinum areas with high dependence on mine jobs and public services, this dependence meant adverse effects could result from mine closures (p.962).

Siyongwana et al. (2019) researched a local community in the Pilgrim's Rest which is a town located in the Eastern part of Mpumalanga, its settlement dates to the European mine explorers that settled in the 1890s. This local community had most of its population dependent on being employed by the mines. Siyongwana et al (2019, p.37) state that mining was conducted on a smaller scale and later gained more traction which increased the community's dependence on mining (ibid). In the late 1990s, Pilgrim's Rest had an economic decline due to the decrease in the gold price. Mining communities do not only have to face the 40-year lifespan of mines which has the above-discussed effects on their closure (Cronje & Chenga, 2009). Local (mining) communities based in rural and dependent on mining companies to sustain their development and livelihood, however, can be exposed to "toxic environmental hazards from mine operation wastes" (Crenje & Chenga). This added to the several socio-economic challenges experienced by local mine communities (Siyongwana et al., 2019, p.368). In 1994, the democratic transition faced challenges in realigning economic and political power, creating new bargains among elites and incorporating non-elites into the decision-making process (Levy et al., 2021, p.14). Elite bargaining, a coordination process among influential actors, tended to prioritize the interests of elites, perpetuating inequality within the minerals-energy complex. Despite a shift in political power, the economic structure established during apartheid persisted, with white economic elites dominating private sector ownership and control (Levy et al., 2021, p.21).

The ANC's accession to power through democratic elections aimed to confer legitimacy for a negotiated constitutional order promising equal rights to all, including previously excluded communities (Levy et al., 2021, p.14). As public institutions like Eskom weakened, political competition became a platform for stability. Elite bargains often involved personalized interests using state authority to capture and allocate rents among elite groups. The challenge was to strike bargains attractive enough to discourage violence while ensuring acquiescence among non-elites through clientelist networks, where public resources were directed to favoured clients rather than serving

the public good (Levy, 2014, p35, p106). Amid these changes, corporate entities like Anglo-America sought corrective measures to address racial and economic disparities. The mining industry's historical control of mines through mining houses or groups was entrenched by-laws under colonialism and apartheid, preventing black ownership and controllership of mine assets (Cook, 1994, p.331; Kilambo, 2021). As South Africa transitioned to democracy, laws like the Minerals and Petroleum Resources Development Act of 2002 (MPRDA) redefined "community," emphasizing a coherent social group with communal interests or rights in a specific land area. Stability is not just about addressing inequality; it is also about aligning the distribution of power with economic benefits to ensure a just transition (Levy et al., 2021, p.14).

Fourth Equity Dimension: Broad-Based Empowerment Initiatives

As stated above, broad-based empowerment refers to what extent has there been equity seen through broad-based empowerment initiatives that can determine the sight of just transition under the minerals-energy complex. These initiatives include acts that seek the integration of previously disadvantaged individuals (such as black people and black-owned companies) into the industrial value chain through local content or economic empowerment. The fourth dimension of equity was seen to be discussed by the SA government in the late 1990s to early 2000s. Levy et al. (2021) state that "BEE efforts to increase the proportion of black South Africans in the country's economic elite have been part of South Africa's policy agenda since the end of apartheid" (p.22). Trade-offs were made for cooperation between white elites and new Black political leadership. Established elites transfer (usually minority) shareholdings in large companies to the consortium of black investors, paid for with debt that would be wound down as dividends flowed in. The elites incentivized black people's empowerment with policies of black economic empowerment and affirmative action which were policy-driven initiatives to correct past imbalances discussed above of unfair labour practices and inequality. In the mid-1990s, Anglo American opened a company called Anglo-Coal which sought to sell unwanted coal projects to black persons (Kilambo, 2021). It did this by creating a holding company called New Coal in 2001 which sold 66% of the assets to Eyesizwe Coal which was a consortium controlled by black people but Anglo America retained 11% and 9% owned by Ingwe Coal (a subsidiary of BHP Billiton), Ingwe Coal is a product of a merger of Rand Coal (from the unbundling of Rand Mines)

and Trans-Natal Coal and Minerals (unbundling of General Mining and Finance Corporation) (Kilambo, 2021). The BEE deals that Anglo American concluded were based on the strategy of creating Special Purpose Vehicles, holding companies and community trusts that bequeath ownership to black shareholders (Kilambo, 2021). “South Africa practised a model of economic development in which cheap and abundant access to coal was used to subsidize energy-intensive mining and minerals beneficiation” Caromba (2023).

To address historical inequalities, the South African government introduced reforms such as Black Economic Empowerment (“**BEE**”) policies to promote ownership and participation of historically disadvantaged groups in the minerals and energy sectors. This marked an early recognition of elements of a "just transition." According to Rakabe (2020), until 2002, five white-owned conglomerates controlled 60% of the Johannesburg Stock Exchange's market capitalization and dominated the country's economic activities. BEE policies were introduced as a corrective measure to redistribute economic power to black South Africans (p. 95–96). The first phase of BEE implementation was driven by the unbundling of mining conglomerates, with the government regulating the process to ensure compliance within the minerals-energy complex. Companies within the sector voluntarily adopted the BEE Charter, with the petroleum and liquid fuel industries signing on first, followed by mining companies in 2002. While the policy initiatives focused on social justice, the concept of a "just transition" was not explicitly coined at the time. However, the Mining Charter of 1994 was pivotal in promoting economic development through BEE policies, which became integral to the post-apartheid mining sector. Additionally, the Minister of Mineral Resources and Energy endorsed the unbundling of Eskom, setting the stage for the integration of renewable energy—an issue explored further in subsequent chapters (Eberhard, 2000, p.15).

Key finding & chapter conclusion

This chapter has constructed the narrative and traced the origin of the minerals-energy complex, providing an institutional overview, of the legal and policy structure that sustained its status quo. The overview of the institutional structure lays the ground for the following comparative review in chapter 4, this institutional structure shows how

the systems built a mineral-focused economic structure that determined the trajectory of who, where and how energy is obtained. The first equity dimension of energy security showcases that there the distribution of energy was biased. It benefited white people and white-owned mining companies including the large international conglomerates like Anglo-America indicating under the minerals-energy complex there was no just transition if observed through the first dimension. After this, the second equity dimension was reviewed and suggested no just transition as unfair labour practices were observed that only benefited white people while black people remained without labour rights or fair wages. The political landscape and incentives played a crucial role in sustaining the minerals-energy complex, with political initiatives grounded in legislative and policy control by elites who owned significant stakes or held executive positions in conglomerates focused on mineral resources. The third equity dimension found a lack of protection for vulnerable communities with the closure of mines and a lack of land ownership by local communities. Just transition started being experienced after several years of inequality and only when South Africa changed the type of state. This was the period which saw broad-based economic empowerment like BEE initiatives. This review provided a historical context that explains the need for South Africa's current transition to renewable energy.

Chapter 3

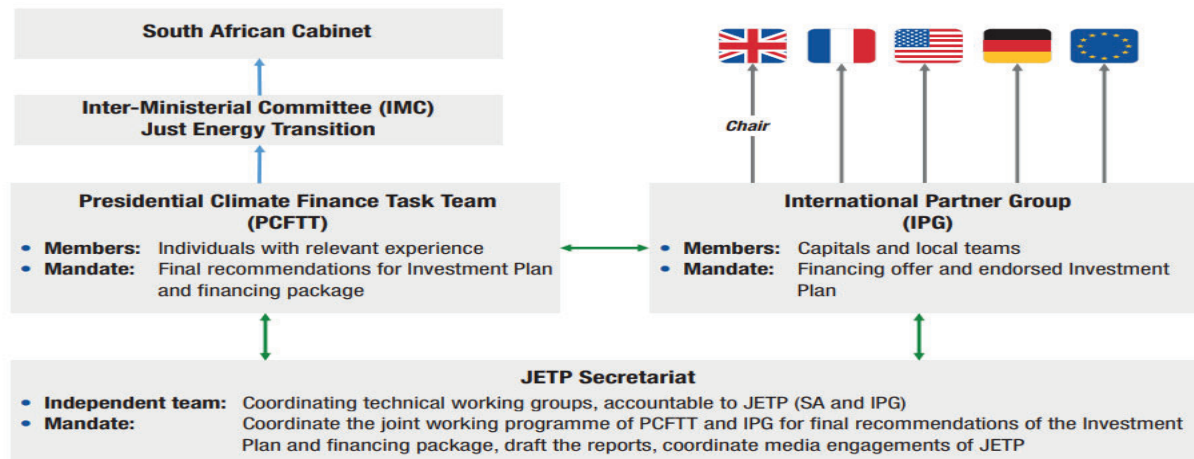
Empirical review of the unfolding renewable energy transition from 2011 to 2023

This chapter seeks to determine to what extent is the current renewable energy transition just, and what trajectory is it promising to drive just transition through the lens to equity focusing on four key dimensions that were observed under the minerals-energy complex. It does this by reviewing what just energy transition seeks to achieve, what it seeks to change and why it matters. It details South Africa's institutional structure or trajectory between 2011 and 2023 and studies the four dimensions which include energy security, inclusivity of job creation, redress of injustices experienced by vulnerable communities and broad-based empowerment initiatives. This is important as during the current renewable energy transition, these key dimensions of equity need to be monitored to be able to determine the extent of just transition in South Africa.

Renewable Energy Transition Institutional Structure 2011 to 2023:

After the failure to make progress from the 1998 White Paper on the Energy Policy that sought to unbundle Eskom and introduce renewable energy companies (discussed in Chapter 2), it was in 2011 that the South African government published the National Climate Change Response White Paper. The White Paper aimed to promote a "just transition to a climate-resilient and lower carbon economy and society" within the country (Connolly, 2022). A significant milestone occurred in 2018 when an agreement was reached at the Presidential Job Summit to establish the Presidential Climate Commission ("PCC"). The PCC is chaired by the South African President and various ministers (see Figure 6 below). Assumed the role of overseeing just transition efforts while ensuring job creation, sustainable economic growth, and energy security. Further progress was made in 2022 when the South African President launched the Just Energy Transition Investment Plan (JET IP).

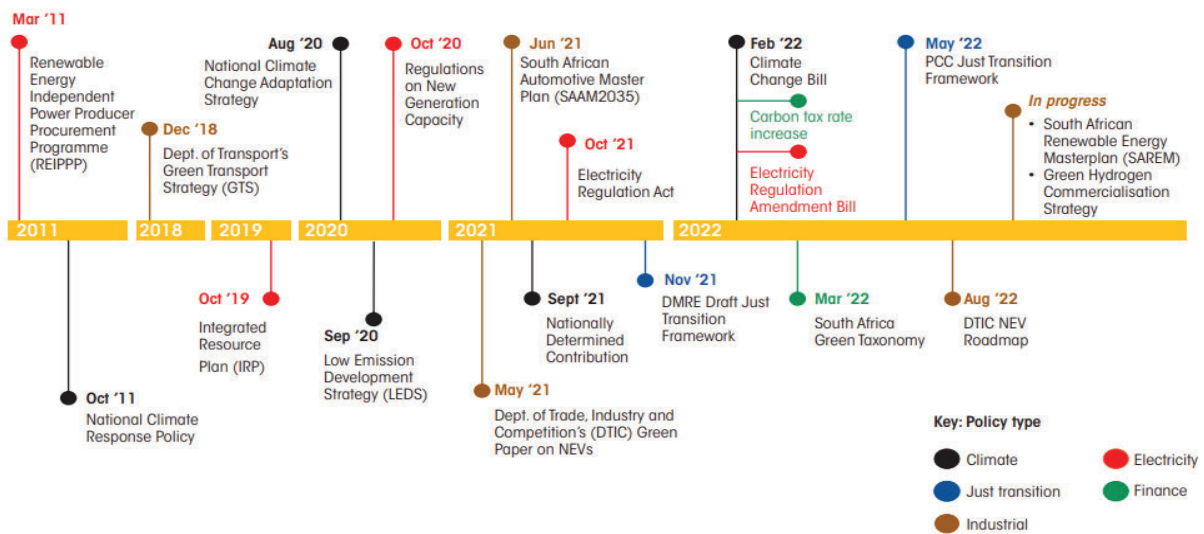
Figure 6: JET Governance Structure



JET IP (2022; p.2)

South Africa's approach to just transition has evolved to align with its unique energy sector needs. The JET IP states that the focal point of the just transition agenda in South Africa is geared towards attaining a high quality of life for all citizens within the context of climate change (p.25). The Cabinet approved the National Just Transition Framework, a product of collaborative efforts involving multiple stakeholders under the guidance of the PCC. This framework builds upon the incorporation of a just transition concept in the 2011 White Paper and Chapter 5 of the National Development Plan. Additionally, it draws from previous work conducted by the National Planning Commission (“NPC”) on just transition pathways and extensive contributions from various governmental and non-governmental institutions (p.25). The primary goal seeks to minimize and mitigate potential social risks, safeguard vulnerable populations, and simultaneously optimize opportunities for structural transformation with the following policy milestones (see Figure 7 below).

Figure 7: Energy Policy Milestones in South Africa 2011 to 2022



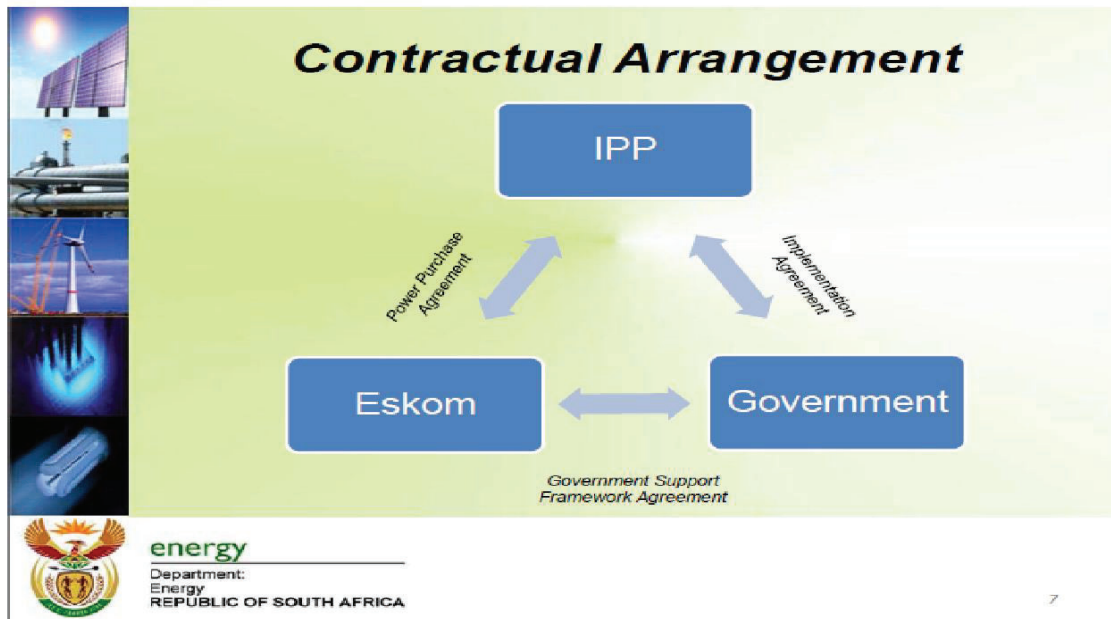
JET IP (2022; p.30)

Notably, the government and businesses have been driven by a shared goal of promoting a reliable energy supply and fostering industrial growth. This shared objective addresses the functional “crisis in electricity supply” faced by the economy, as highlighted by Morris & Martin (2015). The Energy Policy White Paper aimed for a competitive market but resulted in Eskom’s limited ability to build new power plants (Woode-Smite, 2019). Morris & Martin emphasize the critical need for strategic interventions, this potentially would allow Eskom’s current inability to meet the demand of South Africa’s electricity needs because of Eskom’s unsustainable practices and lack of economic direction. Eskom's productivity and service delivery experienced a severe setback in 2008, marked by disruptive load shedding, which had profound implications for the nation's energy landscape. Eskom's pivotal role is evidenced by its staggering contribution, accounting for 91% of South Africa's energy supply and serving as the primary electricity provider to municipalities. Given that under the minerals-energy complex the market power held by Eskom was above 91%, this decrease in Eskom’s market power marks limited progress in change and diversification of market players within energy supply.

The transition from fossil fuels to renewable energy within the framework of a just transition is a complex and multifaceted process. Private renewable energy companies (specifically Independent Power Producers “IPPs”) are identified as central players in facilitating this transition effectively as IPPs introduce change to the minerals-energy complex but remain insignificant compared to Eskom (Winkler, 2020). Through initiatives like the 'Renewable Energy Independent Power Procurement Programme', IPPs engage in a competitive bidding process to develop and operate large-scale power plants in South Africa. This program has successfully procured approximately 102 IPP projects across four bidding windows starting from 2011 to 2015 (IPP Office, 2016: p.16). This enabled municipalities to diversify their energy sources, including solar, wind, hydro, and battery storage. This shift towards renewable energy was prompted by a significant energy demand surpassing the existing supply, leading to strain on power stations and subsequent issues such as tripping and overloading. In response, IPPs emerged as innovative solutions to address this energy crisis.

Amidst Eskom being driven by MEC as its core because of the historical context, for transition to take place and diversify the energy mix, it must facilitate and establish relations with IPPs by signing Power Purchase Agreements (“**PPA**”). This allows IPPs to sell electricity to Eskom, a pivotal step in transitioning towards a just energy future (see Figure 8 below). Central to this process is the integration of Eskom into the heart of the just energy transition framework, highlighting the utility's pivotal position in shaping the transition. For IPPs to meaningfully contribute to the just energy transition, they must integrate socio-economic initiatives into their operations, ensuring that their entry into the electricity market aligns with the principles of a just transition. Notably, Figure 9 below provides a visual representation of the successful projects spanning Bid Window (BW) 1 to 4, highlighting their capacity in megawatts, thereby emphasizing the tangible outcomes of these initiatives and their impact on South Africa's energy landscape as they contribute to clean, sustainable energy, job creation and skills transfer.

Figure 8: Contractual Arrangement between South African Government and Renewable Companies (IPPs)



Department of Energy (2022).

Figure 9: Solar Projects Successful Bid Windows between 2011 to 2015

TABLE 1. Renewable energy projects awarded under the REIPPPP [10]

	Bid Window 1		Bid Window 2		Bid Window 3		Bid Window 3.5		Bid Window 4		Total	
	Capacity [MW]	QTY Projects	Capacity [MW]	QTY Projects	Capacity [MW]	QTY Projects	Capacity [MW]	QTY Projects	Capacity [MW]	QTY Projects	Capacity [MW]	QTY Projects
Wind	648	8	559	7	787	7			1,362	12	3,356	34
Solar PV	627	18	417	9	435	6			813	12	2,292	45
Solar CSP	150	2	50	1	200	2	200	2			600	7
Landfill GAS					18	1					18	1
Biomass					17	1			25	1	42	2
Small Hydro			14	2					5	1	19	3
Total	1,425	28	1,040	19	1,457	17	200	2	2,205	26	6,327	92

Larmuth & Cuellar (2019)

According to Caromba (2023), the South African government meticulously integrated the principles of just energy transition into the intricate fabric of its policies, emphasizing robust job creation and socio-economic upliftment. To operationalize this vision, a rigorous selection process was established for IPPs. A preferred bidder, underpinned by a comprehensive PPA with Eskom, was mandated to fulfil stringent requirements delineated by the Implementation Agreement orchestrated between the Department of Mineral Resources and Energy (DMRE) and the IPP, as illustrated in

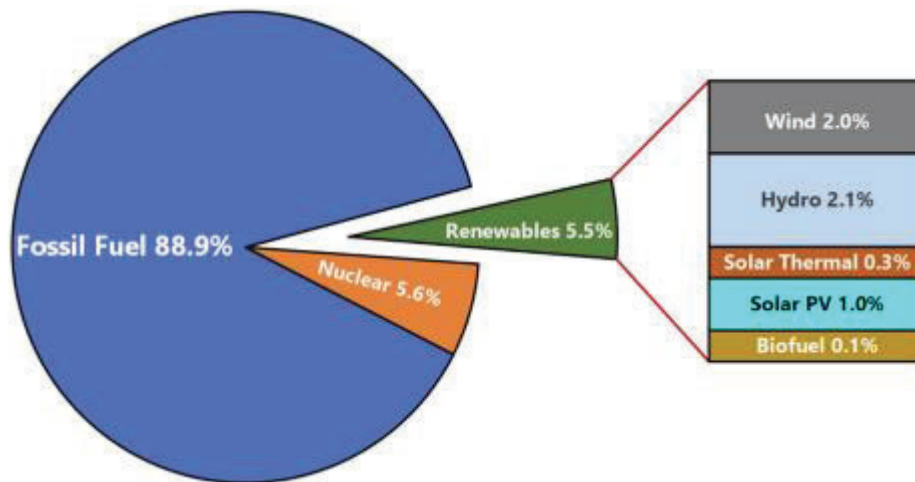
Figure 9 above. There have been 114 operational PPAs with participating PPAs signed with Eskom as the sole public utility company that sells electricity to customers (see Figure 10). These prerequisites included the establishment of a viable project company, securing substantial funding from diverse equity investors, hiring proficient contractors, facilitating land acquisition, and fostering local community engagement channelled through community trusts. Additionally, adherence to Broad-Based Black Economic Empowerment (BBB-EE) guidelines, ensuring the participation and shareholdings of historically disadvantaged individuals, was a non-negotiable criterion (Eberhard, & Naude, 2017, p.11). Noting that IPPs engage with local communities to address community concerns and involve communities in decision-making, an engagement that is pivotal for just energy transition to limit the negative social impact and positive outcomes which are portrayed in Table 1 above which embeds the South African programme that requires IPPs to satisfy “socio-economic criteria related to job creation, localization of supply chains, and community ownership” (Caromba, 2023)

Figure 10: Total Power Purchase Agreements signed by IPPs with Eskom as of 2023

Market Structure	Total Installed Capacity	Installed Capacity Mix %		Total PPAs
Vertically integrated grid, with some IPP participation	52 GW	Coal	71.3	114 operational PPAs
		Gas	7.4	
		Nuclear	3.6	
		Pumped Storage	5.6	
		Hydro	4.0	
		Wind	3.8	
		Solar PV	2.8	
		Solar CSP	0.6	
		Other	1.0	
		Total	100	

Trollip (2023, p.4).

Figure 11: Energy Mix in South Africa in 2021



Akinbami et al. (2021)

This section highlights the challenges within South Africa's renewable energy sector, where Eskom, the dominant state-owned utility, has struggled to meet its targets. Despite efforts to shift towards cleaner energy, fossil fuels continued to account for 88.9% of the country's energy mix in 2021, while renewable energy made up only 5.5% (see Figure 12 above). This imbalance has reinforced the need for diversification of the energy mix and has driven calls for a just transition, aiming to avoid the pitfalls of the previous minerals-energy complex. The government has enacted various policies and initiatives to support a just energy transition, to ensure that electricity resources are distributed fairly and equitably. These policies seek to integrate the principles of a just transition into renewable energy programs, supported by key stakeholders.

The concept of a just transition is framed around four dimensions of equity, which will guide the trajectory of South Africa's energy transformation. By comparing the current energy regime with the previous structure of the minerals-energy complex, it is possible to assess the extent to which South Africa is making progress on a just transition. This comparison helps to evaluate the effectiveness of current public policies and government initiatives, providing insight into the progress made and the challenges that remain. The following dimensions of equity aim to establish a narrative around the just energy transition in South Africa and offer a roadmap for addressing key issues moving forward. These dimensions help to assess how close the country

is to achieving a "perfect just transition" in the energy and renewable energy sectors, guiding future policy and action in pursuit of a fairer, more sustainable energy future.

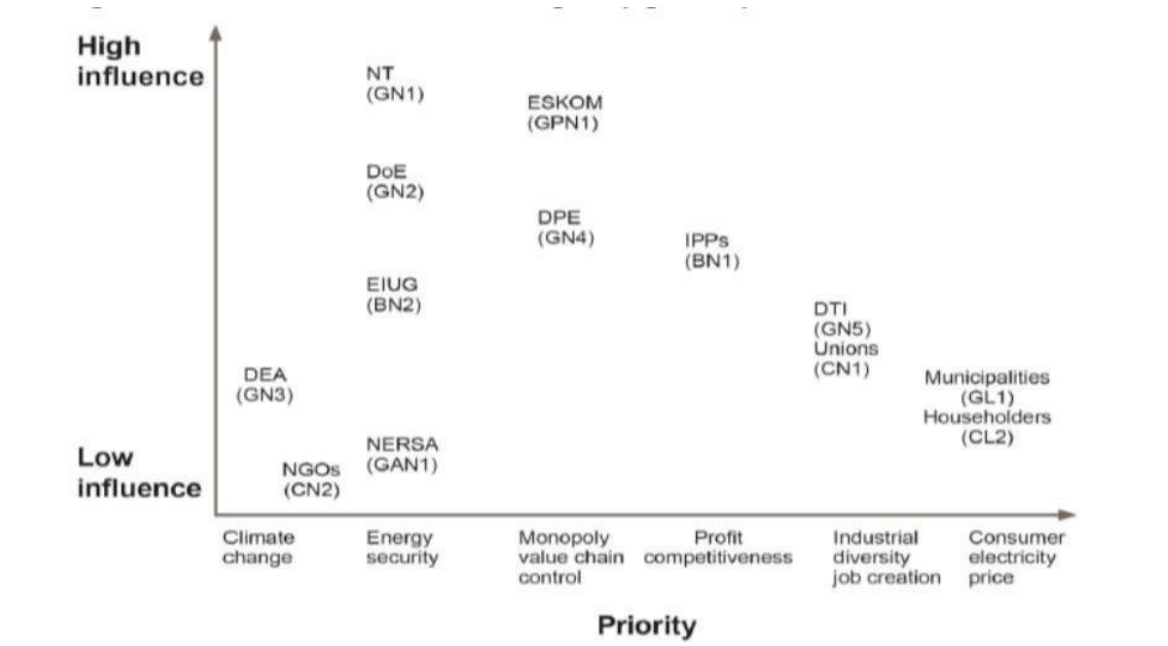
First Equity Dimension: Energy Security under Current Renewable Energy Transition:

The 2019 Integrated Resources Plan ("IRP") highlights the coexistence of coal and renewable energy in South Africa's energy mix, setting a long-term view for the electricity sector's generation mix and guiding investments in new capacity (Ash et al., 2021, p.31). With plans to decommission 24,100 megawatts of coal-powered plants between 2030 and 2050 to promote energy mix and replace ageing coal plants, the IRP emphasizes the need for a socially acceptable "just transition." This involves an engagement process to develop plans and strategies that can mitigate the adverse impact of repurposing plants on local economies and communities (IRP, p.45). Eskom, supplying the bulk of electricity to municipalities and dominating electricity production, faces substantial demand, particularly from the mining, food, tobacco, commerce, public service, and agricultural sectors.

The Energy Intensive Users Group (EIUG), consisting of major electricity consumers, advocates for diversified electricity supplies. These users seek to procure energy directly from IPPs to minimize load shedding and reduce electricity costs. However, IPPs have been criticized for contributing to an electricity-intensive model, potentially exacerbating affordability challenges for low-income households (Phalatse, 2021). This has led to a recalibration of South Africa's regulatory landscape, allowing financially capable municipalities to independently construct and procure electricity from IPPs. This makes a crucial shift in the country's energy governance toward a just energy transition with a diversified distribution approach. However, the limited competition regulation in the energy sector suggests a lack of prioritization in industrial policy for introducing renewable energy. Figure 13 below illustrates a lack of alignment among state stakeholders, ministers, and regulatory bodies in bringing about the necessary transformation and regulation of the energy sector. In 2023, the appointment of Minister of Electricity, Kgosientsho Ramokgopa, brought attention to the persistent role of coal in South Africa's energy future. Despite acknowledging the essential nature of renewables, Minister Ramokgopa asserted the continued need for coal-fired power stations to ensure baseload energy. This declaration reveals a

discord within the electricity sector regarding policy implementation. Eskom's proactive approach to just energy transition, evidenced by the establishment of a dedicated Just Energy Transition office, aims to address challenges such as funding issues and socio-economic repercussions tied to the potential shutdown of coal plants.

Figure 12: Key Actor's Influence & Priority on Energy Policy



Morris & Martin (2015; p.42)

For energy security, bodies like the National Energy Regulator of South Africa (NERSA) present barriers. Mahlaka (2022) highlighted NERSA's licensing regulations as a barrier for IPPs, with uncertainties and complex processes slowing the delivery of renewable energy projects. Transparency and the accountability of NERSA's operational processes have been questioned, prompting calls for comprehensive disclosure to ensure an open and accountable regulatory framework (Dludla, 2023).

In this dimension, there are prospects of energy distribution being mixed between coal and renewable energy. But for this to be effective, Ting & Byrne (2020) argue Eskom would need to stop creating the “unfavourable selection-environment conditions” and not frustrate:

“The entry of IPPs and private investment through the disingenuous use of facts, the political brinkmanship and malicious compliance, through the quiet subversion of government policy by actions such as delayed access or inflated grid-connection costs for IPPs”

This is imperative as the transition to renewable energy is just if it is to be transparent and receive optimum stakeholder collaboration from an energy policy perspective.

Second Equity Dimension: Inclusivity of job creation under Current Renewable Energy Transition:

Due to South Africa's historical context, the term "just transition" is employed with a "labour-centric perspective" (Caromba, 2023). The focus is on the need to decarbonize the economy while safeguarding the economic welfare of workers in carbon-intensive sectors who may face adverse consequences (Caromba, 2023). The National Climate Change Response White Paper of South Africa addresses this concern by aiming to combat the limitations on employment creation. Specifically, within economically unsustainable, excessively carbon-intensive areas, while simultaneously promoting sectors that contribute to a green economy. This approach is firmly grounded in the principles of the South African Constitution, the Bill of Rights, and the United Nations Framework, emphasizing a fair allocation of costs to address inequalities, vulnerabilities, and disparities (p.12).

Aligned with these principles, the JET IP endeavours to create jobs and support workers transitioning out of the coal sector. It emphasizes investments in training and placement for youth and workers within the coal value chain (p.9). Notably, Eastern Cape's renewable energy projects have already demonstrated success, generating 18,132 jobs through one solar farm and 16 wind farms since their inception. Bid windows 1 to 3 achieved remarkable job creation rates of 90% during construction and 95% under operators, with a substantial local spending value of R37 billion (REIPPPP). Sands (2015) researched employment results within renewable energy in South Africa and stated that publicly available data on job creation is non-specific. Sands reviewed DoE's 2013 preferred bidders' potential job creation after bid window 3 bids were submitted and announced. Figure 14 below shows jobs predicted to be created during the construction and operation phase.

Figure 13: Preferred Bidders Potential Job Creation Per Province

Preferred Bidders Job creation per Province		
Description	Jobs during construction period	Jobs during operations period*
Eastern Cape	512	4908
Free State	414	1443
Gauteng	6	240
KwaZulu-Natal	96	240
Limpopo	160	1366
Northern Cape	6502	8736
Western Cape	223	1295
TOTAL	7915	18228

* One job = 12 person-months

Figure 4 BWR3 Job Creation per Province for all technologies (DoE 2013b:17)

Sands (2015; p.16)

Figure 14: Employment Creation between 2014 to 2019



IPP Office & Department of Energy (2019; p.16)

Renewable energy promises great job creation as estimated in Figure 14 above. In 2019, a report by the South African Department of Energy stated that the programme of REIPPP created 40 134 direct job years to be created by 2019 which included

employment of local community persons during the operations of the projects (see Figure 15 above). Further, 33 019 jobs (82%) were during the construction phase of the project and 7 115 which is 18% were created at the operation phase of the projects. However, amidst such positive strides and future estimated projections, in 2017, Eskom closed one of its coal power plants which contributed to jobs. While there have been job losses, in 2019, approximately 200,000 South Africans were employed in the coal energy sector, including mining, power plants, and coal transportation (Caromba, 2023). These mine jobs would need to be protected and not lost given South Africa's official unemployment rate standing at 32.9% in 2023. This means displaced workers from the coal mining sector would face considerable challenges in finding new job opportunities. Moreover, the coal sector's concentration in specific regions, such as the Mpumalanga province, poses a risk of a regional economic collapse in the event of a sudden loss of coal mining income (Caromba, 2023). This implies that as South Africa undergoes a to renewable energy, for there to be a just transition, the extent of just transition must have a balance of job creation while protecting jobs already in the market within the energy sector.

Third Equity Dimension: Redress for historical injustices experienced by vulnerable communities under the Current Renewable Energy Transition:

South Africa has committed to achieving "social inclusivity, eradicating poverty, and putting people's rights at the centre of decision-making" (Mamabolo, 2023, p.22-24). This is why energy policies such as the National Climate Change Response White Paper, emphasize the resolution of vulnerable communities' needs to promote human dignity which is a constitutional right. This must be actioned while ensuring achievable environmental, economic, and social sustainability, objectives that seek to enforce social responsibility. The JET IP initiative, with cabinet approval and an allocated budget of 8.5 billion USD, aims to adopt just transition principles for sustainable development, decarbonization, and the "protection of affected workers and communities" (Whyte, 2022). Further, this seeks to combat adverse effects such as dislocation and erosion of farming that feed the livelihoods of persons living in areas in mining communities (Nxele, 2023, p.287). Socio-economic requirements for local content emphasize "local community empowerment targets," specific initiatives directly benefiting communities rather than broader economic development strategies (Nkoana, 2018). These targets encompass areas such as enterprise development,

management control, job creation, and local ownership. The bid evaluation process for the Renewable Energy Independent Power Producer Procurement Program (REIPPPP) allocates 30% to economic development factors, facilitating the inclusion of black stakeholders, including Africans, Indians, and Coloured people. A minimum of 2.5% ownership within a renewable energy project should be owned by local communities, which has been placed as a procurement condition (Department of Energy, 2019, p.34).

The JET IP strives to improve electricity coverage, invest in skills development, promote social justice and economic growth, and advance renewable energy (JET IP, 2022, p.9). Its purpose includes the enhancement of old coal plants, redevelopment of coal mining lands, and the development of local infrastructure and livelihoods. Recognizing the direct and indirect impacts of the energy transition on the livelihoods of affected workers and communities, the JET IP addresses challenges related to social safety, regional development, and skills development (p.38). Efforts to safeguard the workforce in the coal mining sector align with the broader ethos outlined in the 2023 State of the Nation Address (“**SONA**”), envisioning a just transition that safeguards the interests of workers and vulnerable communities. However, given the high financial contribution by the JET IP, appropriate checks and balances have to be in place for the initiative to be effectively rolled out, and further ensure small local IPPs benefit from the funds, not solely foreign/ international IPPs.

Nkoana (2018) studied issues faced by local communities from IPPs. In this study, an IPP developed and operated two solar parks but faced difficulties in community engagement through a not-for-profit organization appointed for this purpose. Community liaison officers for the solar parks complained about being overworked due to gaps left by the not-for-profit organization. Despite IPPs being expected to allocate up to 2.5% of their annual profits for community development, challenges arise, including potential abuse of status by dominant stakeholders once community trusts are established (ibid). At the local level, municipalities encounter challenges in effectively engaging with Eskom. The Lekwa Local Municipality case in 2022 exemplifies this, where Eskom halted electricity supply to several towns due to municipalities' failure to meet payment obligations. This decision was based on financial grounds and raises ethical concerns as it deprives municipalities of their

ability to fulfil the fundamental duty of providing the basic right of electricity supply to their communities, exacerbating existing social and economic disparities. These challenges highlight the urgent need for comprehensive reforms and strategic initiatives in the South African energy sector, emphasizing not only economic concerns but also the principles of social justice and environmental responsibility in the pursuit of a sustainable energy future central to a just energy transition.

Fourth Dimension: Broad-Based Empowerment Initiatives under Current Renewable Energy Transition:

To address the consequences of the minerals-energy complex, South Africa's democratization process has given rise to a series of economic policies. These policies are designed to promote justice and create an enabling environment for the historically disadvantaged black majority to actively contribute to the economy. The Black Economic Empowerment Act focuses on increasing black ownership in specific industries, while the Affirmative Action (AA) legislation, anchored in employment equity, aims to ensure fair representation of black individuals in key positions and occupations within the economy (Khumalo et al., 2022). Negotiations with conglomerates in the minerals-energy sector culminated in the formulation of the Minerals and Petroleum Resources Development Act ("**MPRDA**"), aiming to instigate a transformative shift in the industry by facilitating the inclusion of black individuals. The MPRDA introduced significant measures, including the state's custodianship of all mineral resources, the utilization of social licenses to transfer equity and mining assets to black communities and individuals, and the provision of preferences to black individuals during the licensing process (Kilambo, 2021).

Under the Mineral and Petroleum Resources Development Act (MPRDA), holders of mining licenses, known as "old order rights," were predominantly owned by existing companies, many of which were controlled by white stakeholders. These companies were required to reapply for new licenses or "new order rights" within five years, with a deadline set for 2009. The reapplication process was contingent upon the integration of black individuals, specifically those referred to as 'historically disadvantaged South Africans' (HDSAs), as shareholders or business partners. To qualify as a black-owned company (BEE), at least 50% plus one share had to be held by black individuals, while

a company would be considered black-controlled if 25% plus one share was owned by HDSAs. The MPRDA set ambitious targets for HDSAs, aiming for 26% equity ownership and 40% black control of mining assets within a decade (Kilambo, 2021). This policy initiative was critical in addressing the historical exclusion of black South Africans from the mining sector, as highlighted by the previous structure of the minerals-energy complex (see MEC above).

While the MPRDA sought to promote black ownership in the mining sector, challenges surrounding black ownership persist, particularly in the context of South Africa's ongoing renewable energy transition. A notable example occurred in 2023 during the Karpowership case, where the Turkish IPP Karadeniz and its BEE partner, Powergroup, formed a joint venture called Karpowership SA. Karpowership SA was awarded a 20-year contract by the National Energy Regulator of South Africa (NERSA) to produce electricity from natural gas as part of the RMIPPPP. However, former Chief Justice Ngcobo ruled that Karadeniz's shareholding agreement with its BEE partner was "oppressive and unreasonable" and violated the core principle of equality. The court found that the terms of the agreement disproportionately benefited Karadeniz, leaving the BEE partner subjected to "stringent and oppressive conditions" without a fair share of the benefits (Comrie, 2023). This ruling is significant in protecting the ownership rights of historically disadvantaged groups, particularly given that IPPs are owned by foreign companies, including those from Norway and Germany (Eberhard & Naude, 2017). The case emphasizes the need for genuine, equitable partnerships in the renewable energy sector to ensure that the just transition benefits all South Africans

Another broad-based economic empowerment initiative is the realm of small-scale energy production, a pivotal shift occurred in 2013 with the introduction of the Small Projects IPP procurement process. This initiative aimed to empower Small and Medium Enterprises (SMEs) to actively participate in the bidding process, allowing them to generate 1-5 MW of electricity. However, despite noble intentions, the implementation faced challenges. In 2021, a controversy arose when IPPs actively engaged in the REIPPPP faced sudden contract cancellations by the Department of Mineral Resources and Energy (DMRE), driven by Eskom's board. This decision, lacking transparency and allegedly rooted in outdated frameworks and budgetary

constraints, imposed financial burdens on IPPs, leading to grievances and substantial financial losses (Engineering News, Creamer, 2022).

Key findings & chapter conclusion

This chapter reviewed the current renewable energy transition institutional structure. It found that this institutional structure is shifting and manoeuvring a minerals' focused structure dominated by a monopolistic firm (Eskom). As such the current policies seek to manage this industrial shift to ensure equity-focused transition. This means the current renewable energy transition must be implemented to the extent that just transition has equal distribution to ensure energy security. This chapter found that under the first dimension, policies seek to achieve energy security that entails fair energy distribution, not solely to industrial companies but also low-income households. But for this to be effective, stakeholder alignment must be achieved amongst key government stakeholders. The second equity dimension is conflicted, there will be potential job creation, but government actors have not yet aligned on how to protect current jobs within the energy space as renewable energy dominates. The third dimension has the right policy initiatives that seek to prevent a repetition of the MEC where vulnerable communities were not accounted for but solely taken advantage of. However, challenges to enact this have been noted which include a lack of community alignment with allocated stakeholders. Eskom's dominance has put forth acts completed without consultation of the right stakeholders like municipalities that distribute electricity to the communities. Lastly, the fourth dimension seeks to promote the inclusion of black people within the IPP projects but issues like unfair contractual terms that disbenefit BEE initiatives have been witnessed. Further, small IPPs experience transparency issues.

In conclusion, tracing the intricate structures of South Africa's energy landscape from 1998 to 2023, this chapter has delved into the complex interplay of policies, initiatives, challenges, and actors within the realm of the just energy transition. South Africa, facing a critical juncture marked by environmental imperatives, socio-economic equity, and technological advancements, embarked on a transformative journey. At the core of this endeavour is the integration of JET principles, aiming not only for sustainable energy generation but also for fostering socio-economic upliftment. The stringent selection criteria imposed on IPPs, with a focus on inclusive community engagement

and the empowerment of historically disadvantaged individuals. The chapter serves as a critical lens, providing a nuanced perspective into the evolving dynamics of South Africa's energy sector, laying the foundation for subsequent discussion and recommendation chapters to follow.

Chapter 4

Comparative Assessment and Discussion

This chapter undertakes a comparative assessment of the four dimensions of equity within the minerals-energy complex and the current renewable energy transition in South Africa. This assessment determines the extent to which South Africa's energy space is on a just transition.

a) The first dimension: energy security comparison

The empirical review of energy security under the minerals-energy complex revealed that the mining of minerals became the cornerstone of South Africa's economy, shaping its industrial and societal fabric. A cornerstone entity within the minerals-energy complex is the vertically integrated monopoly, Eskom, which held market dominance within South Africa's electricity sector (see Figure 1 above which summarizes Eskom's history from 1870). This had clear political backing while coal mining was controlled by corporate giants such as Anglo American, BHP Billiton, Sasol, and others. This was sustained by the legal regimes such as legislations and limited literature was available that could reveal any policy actions that sought to ensure just or equitable energy distribution. The minerals sector significantly propels the energy sector, forming a dual dependence essential for both domestic consumption and export markets. Whilst energy generation relied on black persons for labour, its distribution benefited white-owned companies and communities with the exclusion of black people. Further, few economic pressures were observed that called for change, but it was later only having a longstanding period of energy distribution that was beneficial to industrial and commercial businesses like mining. This meant there were limited just or equitable actions that sought to change the energy

distribution to be beneficial to all. As such energy security under the minerals-energy complex was unjust.

During the period of the minerals-energy complex, black South Africans reaped limited benefits from the country's energy sector. In contrast, the current renewable energy transition aims to ensure that such inequalities are not repeated by implementing energy policies that build an institutional framework supporting a just transition. Under the present shift, there is potential for a mixed energy distribution, combining both coal and renewable sources. However, for this transition to be effective, the shift to renewable energy must be distributed, transparent, and supported by optimal collaboration among stakeholders, particularly from an energy policy standpoint. Achieving this kind of energy security would constitute a true just transition, if it does not encounter regulatory approval obstacles or lead to unequal electricity distribution. Ensuring these conditions will be crucial in making the transition equitable and sustainable for all South Africans.

b) Second dimension: Inclusivity of Job Creation Comparison

Job creation under minerals was beneficial to solely the white people through big conglomerates with limited actions probed by the government to correct. The labour aristocracy of insiders reproduced past inequalities and lacked economic incentives to change. Institutions intricately linked to politicians resulted in decision-making patterns that disproportionately favoured unionized blue and white-collar workers at the expense of those outside the formal economy like black employees. However, a call for change by trade unions was witnessed, and this started negotiations for fair wages for black gold miners and improvement of employment practices. As such, when South Africa was moving from apartheid to a democratic state, the African National Congress and its intra-elites had to accommodate trade union requests to establish equality before the law. This resulted in a call for *just* initiatives to be seen within the energy space, however, this was from trade unions and political parties and not enacted through legislation or government policies seeking credible government commitment that sought companies to be responsible in their job creation and fair employment rights.

In contrast, the current renewable energy transition in South Africa includes initiatives aimed at promoting job creation and protecting labour rights. While data on the full implementation of these labour-focused measures remains limited, there has been job creation associated with the construction and operation of renewable energy plants. However, a key concern is whether South Africa's renewable energy transition should focus solely on creating new jobs or also on protecting existing jobs, particularly those in traditional energy sectors like mining. Job protection, in this context, would involve ensuring the security of jobs already held within the energy labour force, especially those in mining, where employment has historically been concentrated. This remains an unresolved issue among government stakeholders, with no clear strategy on how jobs in the mining sector will be safeguarded as part of the transition. The transition to renewable energy will only be considered "just" if it successfully protects these existing jobs. This is especially crucial given the historical context of the minerals-energy complex (MEC), where employment prospects were tightly linked to the economic drivers of the fossil fuel market. Protecting jobs in the transition to renewables would address this legacy, ensuring that workers are not left behind in the shift to a cleaner energy future.

c) Third dimension: Redress for injustices experienced by vulnerable communities' comparison.

The energy sector in South Africa has long been deeply intertwined with mineral resources, with the mining industry playing a pivotal role in shaping the country's economic trajectory. Mining communities, therefore, became heavily dependent on the mines for their livelihoods, yet they often lacked ownership or control over the mining activities taking place in their communities. This dependence, coupled with a lack of shareholder benefits, reflected the unequal power dynamics within the minerals-energy complex, where the interests of elite stakeholders—primarily white economic elites—were prioritized, perpetuating inequality. Despite political changes after the end of apartheid, the economic structure that sustained white dominance in private sector ownership and control remained intact. Challenges arising from this system, such as environmental hazards and the closure of mines with little regard for the long-term impact on mining-dependent communities, were not adequately addressed through "just" policies or laws. Vulnerable communities continued to face the

consequences of mine closures and environmental degradation, without receiving any benefits or control over the mining operations that were central to their survival. It was not until the early 1990s that South Africa began to see a concerted call for change. For policies that would shift the focus toward protecting vulnerable communities, ensuring they were not neglected or mistreated as part of the mining industry's transition. This shift laid the groundwork for broader economic and social reforms aimed at addressing historical inequalities and supporting the well-being of those most affected by the country's mining legacy.

In contrast, the renewable energy transition in South Africa has prioritized community development initiatives, aiming to ensure a more inclusive and equitable shift away from fossil fuels. However, the closure of coal power plants by Eskom in 2017 revealed significant gaps in governance, particularly in terms of comprehensive dialogue and transparent decision-making. This lack of inclusive consultation undermines the need for a transition that prioritizes labour rights and community welfare. The coal mining industry's history, shaped by strong trade unions, has played a critical role in influencing policies and societal dynamics. Present-day trade unions continue to be active participants in advocating for a just energy transition, ensuring that workers and communities are not left behind in the shift to renewable energy. Eskom's dominance has led to decisions being made without proper consultation with key stakeholders, such as local municipalities that are responsible for distributing electricity to the communities affected by plant closures. This lack of transparency and consensus threatens to derail the just transition, as it fails to ensure that communities are fully engaged and supported throughout the process. For the transition to be truly "just," it must be inclusive, transparent, and built on a foundation of broad consensus that addresses the needs and concerns of all affected stakeholders. Initiatives should avoid repeating the failures witnessed under the minerals-energy complex, where vulnerable communities were exploited without benefiting from the resources extracted from their lands.

d) Fourth dimension: Broad-based empowerment initiatives comparison:

The minerals-energy complex witnessed limited initiatives for change through the introduction of BEE initiatives. Trade-offs were made to foster cooperation between white elites and emerging black political leadership. Established elites transferred their shareholdings in large companies to a consortium of black investors, financed through debt that would be repaid as dividends flowed in. Policies promoting black economic empowerment and affirmative action aimed to rectify past imbalances, specifically unfair labour practices and inequality. The minerals-energy complex structure pre-1998 led to noteworthy events in 1999 when Anglo-American established Anglo-Coal, intending to sell unwanted coal projects to black individuals. This involved creating a holding company named New Coal in 2001, selling 66% of the assets to Eyesizwe Coal, a consortium controlled by black stakeholders. However, Anglo-American retained 11%, and 9% was owned by Ingwe Coal, a subsidiary of BHP Billiton (Kilambo, 2021). Ingwe Coal resulted from the merger of Rand Coal (unbundling of Rand Mines) and Trans-Natal Coal and Minerals (unbundling of General Mining and Finance Corporation). This indicates a just transition was initiated under the minerals-energy complex when policies recognized the need to introduce renewable energy into the energy mix. This move towards a just transition was accompanied by an introduction of an energy mix. In the renewable energy transition, policies advocate for black ownership and redistribution. Court judgments have demanded fairness in contractual terms for IPPs and the protection of BEE rights. However, concerns arise from abrupt contract cancellations for small IPPs, non-transparent regulatory practices, and fears of monopolistic control, prompting critical questions about the trajectory of South Africa's energy transition.

Lastly, there is not a massive shift or divergence in terms of just transition, because pre-1998, there were few actions enacted to promote elements of just transition. The extent of just transition through the lens of equity was not implemented during the minerals-energy complex. The only dimension of equity that was witnessed was the broad-based empowerment of black people (see Table 2 below). However, this only took place in the early 1990s when South Africa was moving from an apartheid government to a democratic state. However, there were limited actions that promoted just transition which policymakers would need to avoid. This means under the current

renewable energy transition; energy policies must ensure the protection of vulnerable communities where renewable energy projects are built. Energy distribution should reach all communities, regions, and areas, and not just commercial companies. Job creation must employ diversified groups of persons and ensure such persons are afforded labour rights including fair wages which was not the case under the minerals-energy complex. The minerals-energy complex has a history South Africa’s energy sector can learn from, given the transition from fossil fuel to renewable energy is recent in South Africa. As such, the findings caution South Africa’s energy space on what should be done and what should be avoided based on a current event that is taking place that hinders or promotes just transition through equity.

Table 2: Key Measurements of “Just” Pre-1998, 1998 to 2011 and 2011 to 2023:

Equity Dimension	Equity under MEC	No equity under MEC	Equity Post 1998 to 2023	No Equity Post-1998 to 2023
Energy security		X	X	
Inclusivity of job creation		X		X
Redress within vulnerable communities		X		X
Broad-based empowerment initiatives	X			X

Source: Author

Chapter 5

Findings, Recommendations & Conclusion

This chapter deduces key findings and makes recommendations alongside predictions for the future. Further, it states the limitations of this research and conclusion.

Findings & Recommendations:

South Africa is currently navigating its path toward a just transition, which differs from the North American model that primarily emphasizes labour rights. In contrast, South Africa's just transition focuses on community ownership, BEE, and equitable energy distribution. This approach is deeply influenced by the legacy of the minerals-energy complex, which historically upheld a system dominated by mineral-centric industries, leaving communities marginalized and excluded from the economic benefits. In the contemporary period, there has been a marked shift toward policies and initiatives that explicitly prioritize BEE, labour rights, local content utilization, and community investments. These policies reflect a broader commitment to achieving a just transition that not only addresses labour concerns but also seeks to correct historical imbalances by fostering inclusive economic growth. By focusing on community ownership and the empowerment of previously disadvantaged groups, South Africa's just transition aligns with principles of fairness and equity, aiming to ensure that the benefits of the country's energy transformation are shared more broadly across its population.

However, due to the market power and dominance of the minerals-energy complex, contested interests are limiting just transition in the current move towards renewable energy. As demonstrated in Figure 13 above competing factions within the state and society have created a contested system with strong veto players, hindering the renewable energy transition. Stakeholder alignment is crucial to overcome these challenges, requiring transparency and consensus within bodies like NERSA, the IPP office, and the Department of Energy, which regulate the transition to renewable energy. Under the MEC, companies operated without significant obligations to the society they impacted. In the current transition, IPPs should be obligated to meet CSR targets that promote a just transition. Policies should go beyond requesting mandatory targets and include monitoring and evaluation of CSR initiatives through "just" audits within renewable energy plants.

This research contributes to South Africa's energy policy space by providing guidelines on avoiding errors and learning from past experiences. It emphasizes that the promotion of a just transition rests on the state or government, and energy policies need to capture the context of what a just transition entails in developing countries. Mitigation strategies should align with South Africa's unique circumstances, tailoring international guidelines to fit its developmental context. The International Labour Organization's (ILO) 2015 non-binding guidelines on a "just transition towards environmentally sustainable economies and societies for all" provide essential principles for an effective just transition. While this research advocates for aligning with the ILO's non-binding guidelines on a just transition, it recognizes that these guidelines may not perfectly fit South Africa's unique circumstances. Adapting international guidelines to a specific context involves challenges and may require careful consideration to ensure relevance and effectiveness. These principles include emphasizing social dialogue, fostering coherence across portfolios, establishing a framework for a just transition, and acknowledging the need for tailored policies.

As South Africa undergoes its transition, it is crucial to recognize that the minerals-energy complex has left the energy sector in a complex state. Eskom currently serves as the main distributor of electricity and all IPPs must enter into agreements with Eskom. Thus, it is recommended that a thoughtful and measured approach to achieving a balanced transition from MEC structures to a renewable energy structure. For an effective transition in South Africa, monitoring of renewable energy companies is essential to ensure they meet socio-economic targets. This includes incorporating skills development incentives for coal workers, and addressing the complexities of the transition should be done through energy policies and regulations mandating adequate monitoring and evaluation procedures. This can include mandatory reporting of CSR targets. Once energy policies have actioned this, it will ensure any future shift within the space of the electricity sector aligns with applicable energy policies and regulations. This would result in South Africa's regulations allowing IPPs to sell renewable energy with private offtakers. Private offtakers will mean Eskom will not be the sole distributor or seller of electricity to customers and IPPs will directly approach the market and enter PPAs with various companies that will sell electricity. This shift would be bound by mandatory requirements embedded in policy and regulations that seek to monitor CSR requirements that embed the four dimensions of equity.

The future of a just energy transition in South Africa will continue to be complex and equitable goals will not be reached if the four dimensions of equity including energy security, vulnerable community redress and broad-based economic empowerment are neglected. Practitioners and policymakers must embed frameworks and initiatives for effective just transition implementation. This includes requiring transparency from energy companies as part of monitoring and evaluation to meet just transition targets. Failure to address these challenges may lead South Africa towards a Renewable-Energy Complex, resulting in job insecurities, a biased energy supply, and a lack of community development and board-based economic empowerment. Challenges experienced in the current transition should be closely monitored for a truly just transition.

Conclusion:

This research sought to determine to what extent the initiatives invested in the ongoing transition towards renewable energy exhibit a far-reaching, just (equitable) trajectory in contrast to the efforts for sustaining equity within the established minerals-energy complex structure in a democratic South Africa. To answer this question, this research traced the concept of just transition which emanated from North America. This thesis found South Africa borrowed aspects of just transition from North America, but South Africa is going beyond labour initiatives and notes the context and current state of South Africa's energy sector. It found that South Africa is moving from minerals minerals-focused institutional structure to an attempt to achieve a truly just transition that is equitable and inclusive, over, and above having a diversified institutional and market structure with a diverse energy mix. The renewable energy transition seeks to bring change to the historical economic and political state compared to the minerals-energy complex, highlighting challenges in labour rights. Under the minerals-energy complex, the issue of inequality dominated and sustained unequal mining jobs that had unfair labour practices, with local communities holding no control or right over economic exploitation that sustained the extraction of minerals, and the energy distribution focused on conglomerates owned by white people. It notes that the minerals-energy complex structure tried to correct the inequality experienced post-1998 but it made little progress. This is because economic power remained in the

hands of mining-focused sectors, with Eskom's political key actors sustaining this complex structure between 1998 to 2011.

In 2011, change began as just transition dominated several energy policies and white papers. The institutional structure has gradually become (or become) competitive but at the direction and dominance of pre-existing minerals-energy complex incumbents. Key stakeholders have a minerals-focused vision with fossil fuel still holding a sizeable percentage of the energy mix, highlighting little progress in transition. However, this dissertation noted that South Africa's energy space will only be in full just transition when it has a delicate balance between economic growth, environmental stewardship, and social justice without challenges that embed the just transition. Given the complexities faced and presented by IPPs, from competitive bidding to the integration of socio-economic initiatives, these indicate an impediment to the transition being just. As such, the thesis concludes that South Africa is on a partial transition where there are energy policies in place. These energy policies are context-specific and recognize the need to correct damage enacted by the MEC, but a delicate balance has not yet been reached for an effective policy implementation.

It concludes that for each dimension of equity to be successfully implemented, there must be stakeholder alignment which includes private companies, trade unions, community leaders/ representatives and government bodies or agencies. Once this has been implemented, only then will South Africa move from a partial just transition to a fully effective just transition that does not repeat MEC's unequal institutional structure. This research concludes that as South Africa is a developing nation with high inequalities, getting the just transition initiatives right will make the country advance in its energy space while protecting and creating jobs, communities, and disadvantaged groups. This advancement will place South Africa on a leading path in inclusive renewable energy development and adoption and hold companies accountable to the environment and society in which the companies function. This will further have key success in energy policy initiatives but also successful policy implementation which has been one of South Africa's core limitations. South Africa's just transition will be in a trajectory that is just and sustainable once such societal and political will is achieved and maintained through adequate monitoring and evaluation initiatives. This will allow backward-faced and forward-looking just transition. By

backwards, this would mean the protection of jobs created by the minerals-energy complex, enacting ILO's principles in a manner that ensures transparency is sustained through CSR targets and renewable energy companies (IPPs) are held accountable to the communities where plants or projects are built, which allows a trajectory that is not a mimic of the minerals-energy complex. By forward facing, this means ensuring that all renewable energy-focused projects sustain energy distribution that is fair and beneficial to local communities, and further ensure that future earnings derived from the operations of the renewable energy projects make payments through shareholding that go back to the communities and their development thereof.

The limitations of this research include:

1. The current renewable energy transition in South Africa, initiated in 2011, is recent. This temporal constraint limits the ability to assess the long-term effects and outcomes of the transition fully. As a result, the research may not capture the complete picture of the transition's impact on various dimensions.
2. The empirical data under the minerals-energy complex primarily had industry-focused evidence, while the current renewable energy transition review relies more on a policy review. This disparity in focus might introduce bias or limit the depth of the analysis, however, this thesis was able to obtain data that provided a forecast or prediction of what could potentially result from the transition into renewable energy in terms of job creation, community ownership and other broad-based initiatives.
3. It could not determine the full extent of the distribution of renewable energy, as it is still in the preliminary stages. This limitation poses a challenge in predicting the socio-economic and equity outcomes in terms of energy distribution, hindering a comprehensive evaluation of the just transition.
4. Although mandatory CSR is beneficial, it may be driven by public perception rather than a genuine commitment. This limitation raises questions for future researchers about the effectiveness and authenticity of CSR initiatives in promoting a just transition.
5. The complexity left by the minerals-energy complex structures may not entirely be a straightforward process, and a thoughtful approach is recommended.

However, navigating this complexity and ensuring a smooth transition is challenging and may require a more nuanced understanding.

6. As this research's predictions are based on current observations, uncertainties in external factors or unforeseen developments may impact the accuracy of these predictions.

Understanding these limitations is crucial for interpreting the research's findings and recommendations accurately. Future research and ongoing monitoring of the renewable energy transition will help address some of these limitations and provide a more comprehensive understanding of the just transition in South Africa.

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