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Towards “Just” Energy Transitions in unequal societies: an actor-centric analysis of South Africa’s evolving electricity sector

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Abstract

The rapid and intensifying impacts of the changing climate and subsequent need to alleviate these have resulted in the synonymous pathway towards a global energy transition. Through enhanced national climate action plans, countries worldwide are formulating development pathways that are aligned to a carbon-neutral and net-zero emissions global economy.

The recent IPCC Sixth Assessment report confirmed, once again, the urgency to reduce emissions to prevent catastrophic climate impacts. While nations have submitted their enhanced climate action plans, developing countries like South Africa battle with severe developmental challenges. The imperative to respond to climate change alongside addressing entrenched development challenges such as high unemployment, inequality, and poverty make it essential for the country's energy transition to be just.

Frameworks theorising technological transitions predominantly originate from the global north. Thus, to avoid adopting frameworks from their place of origin and replicating them in different contexts, this study merges Geel's multi-level perspective (MLP) framework with the energy justice framework to have a better understanding of the composition of actors and discourse shaping South Africa's just energy transition debate. The study achieves this by operationalizing a range of qualitative discursive approaches, namely content and media frame analysis. Over an 11-year study period, online newspaper articles are used as a unit of analysis to develop actor categories, these are accompanied by frames (in the form of statements said by the identified actors).

With the assumption of there being no agency at the landscape level of the MLP, landscape developments placing pressure on the regime identified from the analysis include the climate change phenomenon, pressure from the international community, and declining global demand for coal. At the regime level, actors engaging in activities reinforcing the status quo such as Eskom and members of business fell within the incumbent (core) actor category whereas actors who were identified as outsiders (i.e., those that openly criticize the regime by highlighting problems associated with it) mainly consisted of civil society groups. Within each actor category, actors use discourse that either stabilizes or destabilizes the regime. At the niche level, the financial intermediary role played by development finance institutions (DFI's) emerged as key to creating protective spaces for the adoption of renewable energy technologies throughout the study period.

Finally, because of the varying levels of power and interactions between actors across the multiple levels of the country's energy transition, issues of fairness in decision-making (procedural justice), representation (recognitional justice) and share in costs and benefits of the regime and transition emerge (distributive justice).

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List of Abbreviations and Acronyms

AIDC	Alternative Information and Development Centre	ETI	Energy Transition Index
AMCU	Association of Mineworkers and Construction Union	GDP	Gross Domestic Product
BASIC	Brazil, South Africa, India, China	GHG	Greenhouse gas emissions
BUSA	Business Unity South Africa	GW	Gigawatts
CER	Centre for Environmental Rights	IDC	Industrial Development Corporation
CEH&SIG	Climate, Energy and Health Special Interest Group	IEA	International Energy Agency
CIF	Climate Investment Funds	ILO	International Labour Organization
COSATU	Congress of South African Trade Unions	INDCs	Intended Nationally Determined Contributions
CPUT	Cape Peninsula University of Technology	IPCC	Intergovernmental Panel on Climate Change
CSIR	Council for Scientific & Industrial Research	IPPs	Independent Power Producers
DBSA	Development Bank of Southern Africa	IRENA	International Renewable Energy Agency
DEA	Department of Environmental Affairs	IRP	Integrated Resource Plan
DFFE	Department of Forestry, Fisheries, and the Environment	KWIC	Keywords-in-context
DFIs	Development Finance Institutions	LAC	Life Africa Coal
DMRE	Department of Minerals Resources & Energy	LCE	Low Carbon Economy
DoE	Department of Energy	LEDS	Low Emissions Development Strategy
ED	Energy Democracy	MEC	Mineral Energy Complex
EIUG	Energy Intensive Users Group	MLP	Multi-level perspective
EPA	Environmental Protection Agency	MoA	Memorandum of Agreement

MW	Megawatts	SANEDI	South African National Energy Development Institute
NDCs	Nationally Determined Contributions	SAPVIA	South African Photovoltaic Industry Association
NDP	National Development Plan	SAREC	South African Renewables Energy Council
NERSA	National Energy Regulator of South Africa	SARI	South African Renewables Initiative
NGOs	Non-governmental Organisations	SAWEA	South African Wind Energy Association
NPC	National Planning Commission	SDGs	Sustainable Development Goals
NT	National Treasury	SNM	Strategic Niche Management
NUM	National Union of Mineworkers	SU	Stellenbosch University
NUMSA	National Union of Metalworkers of South Africa	TM	Transition Management
PCC	Presidential Climate Commission	TIS	Technological Innovation Systems
PHASA	Public Health Association of South Africa	UCT	University of Cape Town
RE	Renewable Energy	UK	United Kingdom
REIPPPP	Renewable Energy Independent Power Producers' Procurement Programme	UN	United Nations
SA	South Africa	UNFCCC	United Nations Framework Convention on Climate Change
SADSAWU	SA Domestic Service and Allied Workers Union	UNRISD	United Nations Research Institute for Social Development
SAFCEI	Southern African Faith Communities Environment Institute	USA	United States of America
SALGA	South African Local Government Association	SANEA	South African National Energy Association

WEF	World Economic Forum		
WWF SA	World Wide Fund for Nature - South Africa		

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Chapter 1: Introduction

1.1 Background

The signing of the Paris Agreement marked an important milestone towards collective action in response to climate change. Yet, criticism regarding the level of ambition and subsequent commitment to the implementation of national climate plans known as the Nationally Determined Contributions (NDCs) continues to be a leading concern in the global climate debate (United Nations Framework Convention on Climate Change [UNFCCC], 2021).

Emphasizing the need for real action, the recent sixth assessment Intergovernmental Panel on Climate Change (IPCC) report confirmed, once again, the urgency to reduce emissions to prevent catastrophic climate impacts, as global temperature rise has already increased to 1.1°C (IPCC AR6, 2021). In addition to this, towards the end of 2021, 131 countries had adopted, announced, and began considering net-zero targets by 2050, accounting for over 70% of global emissions (Charlton, 2021).

At a wider scale, these efforts are synonymous with a global energy transition i.e., transformation of the global energy sector from fossil-fuel-based energy production to zero carbon by the end of the second half of this century (International Renewable Energy Agency [IRENA], 2019). The evidence of this shift is seen in the increasingly reducing cost of newly installed renewable energy (RE) globally (IRENA, 2019).

Whilst the aversion of irreversible climate change requires the reduction of GHG emissions from every sector of the global economy (Rissman *et al.*, 2020), the power sector's substantial contribution to the world's fossil-fuel based carbon emissions; primarily emerging from coal-fired power plants make it essential for the sector to receive initial attention (Dorian *et al.*, 2018).

Although the responsibility to curb the impacts of climate change rests on all nations, the African continent is uniquely challenged in that whilst it only contributes 3% towards global emissions (Ritchie, 2020), it remains the most vulnerable to the impacts of climate change (Ayompe, Davis and Egoh, 2020). This has sparked many a debate with the main stance being that the continent be afforded a different path towards net-zero compared to wealthier nations (Zubairu, 2021). The essence of this argument lies in the need for climate investment decision making that is cognisant of the continents need to further grow and develop its economy,

address social and economic issues whilst transitioning so as to simultaneously build climate resilience (Goldstone, 2021).

Due to its long history of dependence on coal to produce electricity, South Africa is responsible for nearly half of the continent's emissions (Joubert, 2022) placing it under immense pressure to decarbonize its energy production systems. As evidenced through the recently revised and enhanced NDC (NDC Partnership, 2021), the South African government recognises the moral obligation it has towards reducing its GHG emissions (Department of Forestry, Fisheries, and the Environment [DFFE], 2021). In addition, included in the revised NDC is the need for the country's energy transition to be "just". This is because developing nations like South Africa carry an additional burden of having to transition towards clean energy sources whilst also tackling a range of development-related challenges such as poverty, inequality, and unemployment (Winkler and Marquard, 2009; Winkler *et al.*, 2020, Climate Investment Funds [CIF], 2020). Whilst barriers such as path dependency, lock-in, and resistance to change have remained common themes in energy transitions across all global scales (Rogge *et al.*, 2017), the need for clean transitions to be just remains more pertinent in countries with deep structural inequalities (CIF, 2020).

1.2 Research Focus

South Africa's energy sector is at the cusp of a major transition. Bischof-Niemz and Creamer (2018) describe this transition as "highly topical, emotive and politically contentious". Because contention within transitions tends to arise from competing objectives by varying actors (Rennkamp, 2019), this study sets out to contribute to the analysis of the just energy transition debate in South Africa's electricity sector.

In the past, energy systems were typically reduced to narrow configurations of technologies, production prices, and the accompanying emissions that they release (Miller, Illes and Jones, 2013). Over time, this view has been replaced by the understanding of energy systems being more than pipes, machinery, mines, and refineries. Instead, the analysis of energy systems and transitions now calls for the acknowledgement of the social processes that stimulate and guide energy system transformations (Miller, Illes and Jones, 2013). As such, analysing energy transitions through the socio-technical transition lens and more specifically through the multi-level perspective (MLP) framework has received overwhelming preference. This stems from the MLP's dual ability to serve as a means of explaining how technological transitions come

about and its accommodation of the role and interaction of actors within transitions (Steward, 2012).

This study examined the role of key actors in shaping the country's energy transition at the landscape, regime, and niche levels of the MLP. The study has also responded to the call made by Williams and Doyon (2018) who argue for the need for transitions research to take justice into account.

1.3 Research Aim and Objectives

The primary question that this research seeks to answer is how do central actors shape concepts of “justice” and “injustice” in the multiple levels of South Africa's energy transition?

1.3.1 Aim

With the above research question in mind, this study **aims** to have a better understanding of the discourse shaping South Africa's just energy transition debate by exploring the justice issues that emerge across the three spheres (landscape, regime, and niche) of the multi-level perspective (MLP) framework (Geels, 2011).

1.3.2 Objectives

Considering the above-outlined aim, the key objectives of this study are:

1. To understand the composition of central actors shaping South Africa's just energy transition discourse.
2. To understand the claims used by central actors to shape South Africa's just energy transition discourse.
3. To understand the policy position of the national government regarding the country's just energy transition.

1.4 Thesis outline

The thesis is structured as follows:

This introductory chapter provides the background information and contextualizes the selected topic within the broader research problem.

Chapter 2 introduces the reader to the research literature related to the topic by expanding on the broader thematic areas and drivers behind the energy transition from a global and South African perspective. This chapter ends by linking the concepts of social justice and energy transitions.

Chapter 3 presents the research design of the study which mainly entails the methods that were used to collect and analyse data. Each of the adopted methods for data collection and analysis is accompanied by a set of limitations.

Chapter 4 provides the findings, analysis, and discussion of the study using the methods highlighted in chapter 3 of the dissertation. The chapter is divided into five sub-sections i.e., the analytical framework followed by four sub-sections, namely the socio-technical landscape analysis, socio-technical regime analysis, socio-technical niche analysis, and policy analysis sections.

Chapter 5 provides a brief discursive overview of the summary findings, followed by concluding remarks.

Chapter 2: Literature Review

2.1 Global Energy Transition Underway

Past energy transitions reveal that the search for suitable energy sources to meet basic requirements such as food, shelter, and warmth has been a key theme since the beginning of civilization (Solomon and Krishna, 2011). This proves that energy systems are continuously changing (Williams and Doyon, 2018), making energy transitions a permanent phenomenon (Singh *et al.*, 2019). Geels *et al.*, (2017) however, argue that the goal-oriented nature of the current global low-carbon transition distinguishes it from historical transitions which were largely ‘emergent’ in nature. Black (2018) and Singh *et al.*, (2019) support this statement by labelling the current transition as urgent and unprecedented.

2.1.1 Drivers of the Global Energy transition

2.1.1.1 The challenge of a centralised electricity supply

According to Defeuilley (2019), for the last century or so, “the electricity sector has been built and developed around a centralised and standardised generic model”. This model was primarily designed to supply cheap electricity and to feed the rising energy demand (Defeuilley, 2019). Centralised electricity generation entails the “large-scale generation of electricity at centralised facilities located away from end-users connected to a network of high-voltage transmission lines” (Environmental Protection Agency [EPA], (2018). These kinds of systems typically include fossil-fuel and nuclear power plants, hydroelectric dams, etc. (EPA, 2018; Momoh *et al.*, 2012). Though centralised power generation systems have been the most dominant in use, serving large populations over several years. The relatively recent pursuit of both energy efficiency, reliable electricity supply, and the reduction of greenhouse gas emissions to combat climate change has resulted in the negative impacts associated with the centralised power generation system receiving much scrutiny. The very core of these centralised systems i.e., coal mining has been labelled as one of the most destructive activities. Both Cock (2019) and Carruthers (2019) highlight this activity to be the main driver behind the soaring levels of environmental inequality. The basis of this argument stems from the claim of coal mining impacts such as polluted air and the general lack of access to basic services being understood to be disproportionately distributed to certain social groups in society (Cock, 2019; Carruthers, 2019; EPA, 2018). The centralised energy system has also been criticized for being mainly beneficial to a handful of individuals namely incumbent players with power and vested interest in maintaining the current fossil-fuel-based energy system (Rennkamp, 2019; Halsey, 2019 and Lawrence, 2020). Defeuilley (2019) attributes the very success and spread of the standardised

electricity system to the structure and influence of the elite. The entrenchment of these actors (organised into coalitions in support of coal) and the notable impact of the centralised system on the environment has thus placed a magnifying glass on the negative externalities associated with coal use. These circumstances create an enabling environment for the adoption of decentralised and cleaner power generation facilities.

The emergence of the current transition and its reliance on the rapid adoption of renewables means that the transition towards a cleaner global economy has the “potential to disrupt the fundamentals of the electricity system as we know it”(Defeuilley, 2019). This argument coincides with the shift from the conventional view of coal being seen as “necessary for development” (Cock, 2019) towards a path that seeks alternative energy sources with minimal impact on people and the environment.

2.1.1.2 Energy for all

According to Westphal *et al.*, (2017), the world’s population is projected to grow by 2.4 billion people (from 2015) by the year 2050. The implication of the projected increase in the world’s population means that humanity will be faced with unprecedented energy access challenges. These challenges, however, are not just a problem of the future. According to Pachauri and Brew-Hammond (2012), a quarter of people in the world today do not have access to electricity. This is a cause for concern because, for years, energy has been understood to have a significant influence on peoples’ lives with regard to their social development and economic growth as it “contributes to the basic needs of humanity such as nutrition, warmth and lighting” (Pachauri and Brew-Hammond, 2012). This is corroborated by Lloyd (2017) who identifies that most, if not all aspects of development such as wealth, health, nutrition, water, infrastructure, education, and life expectancy as being strongly related to the consumption of energy per capita.

The recognition of the need to narrow the persistent energy deficit has thus led to the international community including calls for universal access to affordable, reliable, and modern energy services, and this is embodied in the 7th Sustainable Development Goal (SDG) of the United Nations (International Energy Agency [IEA] *et al.*, 2019; Gielen *et al.*, 2019). Again, amongst other mechanisms, the adoption of a decentralised renewable energy generation system has been highlighted as one of the key strategies for closing the current energy access gap (Pachauri and Brew-Hammond, 2012).

2.1.1.3 Global Renewable Energy (RE) uptake and cost-effectiveness

The unprecedented change in the global energy system is accompanied by a range of uncertainties and these vary by region. However, according to Fattouh *et al.*, (2019), though the nature of the global energy transition remains highly uncertain, forecasts by various international organisations reveal an undeniable consensus regarding the increasing share of renewables in the global energy mix. In the year 2018, renewables accounted for almost two-thirds of global investment in power generation and contributed roughly the same percentage to new net electricity generation (REN21, 2019). These trends have inevitably made renewables a critical contributor to emissions reduction in the energy sector (REN21, 2019). According to Gielen *et al.*, (2019), the record additions of installed RE power capacity can be directly attributed to rapidly falling costs and competitiveness particularly of solar photovoltaics (PV) and wind. To date, the downward trend in solar PV and wind energy prices is expected to remain constant until the year 2030 (Defeuilley, 2019). What makes the falling cost of renewable energy technologies even more attractive is that it has been happening alongside increasing costs of fossil fuel extraction, meaning that renewables no longer only depend on regulation for growth (S&P Global, 2020). The cost-effectiveness of renewables and the ability to simultaneously reduce emissions make it a suitable alternative to meeting two-thirds of the total global energy demand (Gielen *et al.*, 2019).

On the opposite end of the spectrum, York, and Bell (2019) argue that the current reference to a global energy transition is misleading. The essence of this argument contests the plausibility of renewables replacing fossil fuels by stating that previous transitions were more about changes in the proportion of energy produced by various sources as opposed to a complete replacement of one energy source by another. As a result of this, both authors advocate for the current changes in the global energy system to be termed “energy additions” as opposed to energy transitions.

2.2 Justice in Energy Transitions

2.2.1 Energy justice

Energy transitions generally create inequalities in the distribution of harms and benefits (Miller, Illes and Jones, 2013; Williams & Doyon, 2018). Often, dangerous pollutants associated with energy tend to be concentrated in areas where people have very little political power and resources whilst those consuming the most energy remain free from such harm (Miller, Illes and Jones, 2013; McCauley *et al.*, 2018). During transitions, old injustices can be either be

reinforced or new ones may be created (Jenkins *et al.*, 2017). The realization of injustices in energy systems and transitions alike has resulted in increasing energy justice and fairness enquiries in the study of transitions (Heffron and McCauley, 2017).

The concept of energy justice envisions “a global energy system that fairly distributes both the benefits and burdens of energy services and one that contributes to more representative and inclusive energy decision-making” (Sovacool *et al.*, 2017). The three main tenets of energy justice identified in literature are distributive justice, recognitional justice and procedural justice (McCauley *et al.*, 2018; Sovacool *et al.*, 2017; Montmasson-Clair (2021), Williams and Doyon, 2018).

- **Distributive justice** addresses the direct impacts emanating from the transition process by focusing on the way the distribution of costs, benefits and risks between actors is spread (Axon and Morrissey, 2020; Montmasson-Clair, 2021).
- **Recognitional justice** goes beyond merely allowing individuals the freedom to participate but ensures fair representation of all and equal rights” (Axon and Morrissey, 2020).
- **Procedural justice** is more concerned about who is included in energy decision-making processes and seeks to ensure that energy procedures are fair and inclusive at all levels (CIF, 2020; McCauley *et al.*, 2018).

According to Muller *et al.*, (2021), energy justice as a concept has expanded to include another dimension i.e., restorative justice. In the energy context, restorative justice takes into consideration the past, present, and future damages that have been/will be incurred by individuals and communities by advocating for the rectification of such an occurrence (Heffron and McCauley, 2017; Montmasson-Clair, 2021). Similarly, Muller *et al.*, (2021) explain it simply by describing it as a concept that makes it necessary for decision-makers to engage with injustices caused by energy projects and rectify them.

Thus, to guarantee fair and equitable access to resources, technologies and decision-making processes, McCauley *et al.*, (2018) highlight the need for the low carbon energy transition to take energy justice into the policy formulation process. Sovacool *et al.*, (2017) describe this as the need for “justice aware energy policy”.

2.2.2 The “Just Transition” concept

The initial conceptualization of the “Just Transition” stems from North American Trade Union demands for the support of workers faced with the challenge of losing their jobs due to the

increased implementation of environmental policies (Burrow, 2017); United Nations Research Institute for Social Development [UNRISD], 2018; Winkler *et al.*, 2020). Though initially about the protection of jobs. Today, “just transition language has entered into the mainstream of climate change debates where it is used by UN organisations, governments, non-governmental organisations (NGOs), indigenous people, businesses, and philanthropists” (UNRISD, 2018). The use of the term and its understanding stems from the awareness of the global shift towards a low carbon economy likely resulting in “winners and losers” because of the uneven distribution of the benefits and costs of decarbonization (Eisenberg, 2018).

Being that as it may, whilst the just transition is understood and applied in different ways, it is still almost impossible to divorce it from the “protection of affected fossil fuel workers and communities” narrative. This principle is even enshrined in the “Just Transition” guidelines towards environmentally sustainable economies developed by the International Labour Organization (ILO) in 2015. These guidelines state that a just transition towards an environmentally sustainable economy must be well managed, contribute to goals of decent work for all, eradicate poverty and be socially inclusive (ILO, 2015). As a result, in modern days the just transition to a low carbon economy is about being equitable and is heavily characterized by tenets of distributive fairness and justice (Winkler *et al.*, 2020). Halsey *et al.*, (2019) corroborate this by saying that “a just transition is about justice in the context of fundamental changes within the economy and the society”.

Explained differently, the just transition can be better understood as a reference framework of analysis that brings together climate, energy, and environmental justice (McCauley and Heffron, 2018). This understanding calls for all three of these scholarships to concurrently assess and provide solutions for emerging injustices in the face of rapid transitions (McCauley and Heffron 2018).

2.2.3 Energy democracy (ED)

The need for energy transitions to consider social justice, equity, and innovation (Bloem, Swilling and Koranteng, 2021) has given rise to the relatively new and growing literature on energy democracy (ED). Whilst Burke and Stephens (2018) note ED’s defiance of an exact definition, much of the literature describes ED as an emergent social movement primarily associating itself with energy infrastructural development towards socio-political and socio-economical change (Bloem, Swilling and Koranteng, 2021). ED does this by promoting policy instruments and processes that resist the dominant energy regime. Much of this is seen in ED’s

support for the reclamation of democratically restructured energy systems (Bloem, Swilling and Koranteng, 2021). ED's view of energy as a public good that can be publicly owned and democratically managed makes ED a strong advocate for decentralised RE systems that afford energy access and social justice for all (Bloem, Swilling and Koranteng, 2021). The inclusive nature of ED is intricately linked to the concept of procedural justice which advocates for the democratic dimension of justice by considering questions of participation and political representation. The emergence of ED and increased enquiries of justice in energy transitions highlight a critical juncture in energy governance.

2.3 South Africa's Energy Transition Landscape

2.3.1 Africa's most fossil-fuel intensive economy

As alluded, South Africa's large coal reserves and subsequent over-reliance on coal-fired power plants for electricity generation under the state utility Eskom, have always made the country an anomaly in the continent's power sector (Ford, 2020). To date, the utility has enabled the country to develop a generating capacity of 52GW (Ford, 2020). The instrumentality of coal in South Africa's economic development is not only limited to the mining sector but to the broader industrialization and economic development of the country (Minerals Council South Africa, 2019). Whilst employing a total of 92 230 people in 2019 (Minerals Council South Africa, 2019), the sector also contributes 2.3% to South Africa's Gross Domestic Product (GDP) accounting for 40-45% of sales income from the export market (Hanto *et al.*, 2022). According to the Department of Minerals Resources and Energy (DMRE, n.d.), five companies account for 85% of the saleable production of the coal. The entrenchment of the country's economic expansion and development on coal stems from its' energy-and-capital intensive development path, the Mineral Energy Complex (MEC) (Winkler and Marquand, 2009; Baker, Newell, and Phillips, 2014; Halsey *et al.*, 2019; Winkler *et al.*, 2020). In essence, the MEC is understood as the evolving system of production and consumption emanating from a history of heavy reliance on the country's cheap and abundant coal resources on the back of equally cheap labour (Baker, 2017). As such, Castel-Branco (2018) defines the MEC as "a system of capital accumulation, that develops around an extractive core, dominating sector linkages, finance, state policy, class formation and struggle". The centrality of the MEC in South Africa's political economy and development was initially highlighted by Fine and Rustomjee (1996).

Although the current development path has for years been able to provide domestic and foreign capital from inexpensive and plentiful coal-generated electricity, it is not without any

challenges. Coal has a high carbon-dioxide content. This has led to the country being the 14th largest GHG emitter in the world (Carbon Brief, 2015). According to Baker *et al.*, (2015), the electricity sector lies at the heart of South Africa's energy-intensive economy and is responsible for close to 45% of the country's emissions.

2.3.2. Resistance to coal

In South Africa – the year 2019 saw the Minister of Energy and Mineral Resources signing the country's Integrated Resource Plan (IRP) which highlighted a notable contribution of renewable energy to total electricity capacity by 2030 (Cliffe Dekker Hofmeyr [CDH], 2019). Such action is in line with the global search for alternative energy sources (Winkler, 2020). Whilst coal remains a key source of electricity generation in South Africa, there is a need to reduce the high carbon content of the current development path. The extraction of coal through cheap open cast mining has resulted in the country generating just over 90% of its electricity from large coal-fired power stations (Baker and Phillips, 2019). Employment in the coal sector, growth in the proportion of the country's population with access to the grid and sunk investments are amongst some of the reasons that have resulted in the dominance of coal electricity production.

Coal, however, contributes significantly to carbon emissions and overtime has been associated with a range of other negative impacts. This has resulted in growing resistance towards coal mining and the burning of fossil fuels overall, leading to coal being considered as no longer economically and environmentally sustainable (Baker, Newell, and Phillips (2014). The main reason that literature reveals for the unsustainability of the reliance on coal to date are the accompanying injustices that it comes with. Firstly, though the current system allowed for massive electrification across the country, many people still cannot afford electricity (Halsey *et al.*, 2019). This is corroborated by Baker and Phillips (2019) who state that many low-income households cannot afford to use the grid to which they are connected. In the year 2015, slightly more than half (54%) of the population were considered energy poor (Sustainable Energy Africa, 2014). Affordability is linked to the increasing tariffs of the country's utility over the years which have left a number of people without lights (Halsey *et al.*, 2019). The second injustice identified in literature relates to the negative health impacts from air and water pollution in coal-producing regions in the country (Halsey *et al.*, 2019). Mpumalanga Province houses 11 of the 15 coal stations in the country and to date, studies have found that air pollution from fine coal particles is associated with a range of health impacts. These include respiratory and cardiovascular issues resulting in the annual health cost of the country's utility totalling

R28bn a year (groundWork, 2018). The impact on the environment is the third injustice noted in literature. This is also especially prevalent in coal-producing regions wherein environmental impacts are said to affect only a certain group of people namely, those living close to the power stations.

2.3.3 The state of South Africa's electricity utility – Eskom

Eskom is an extremely important entity to the functioning and growth of the country and continent's economy overall. However, as with the rest of the country's state-owned enterprises, allegations of theft and corruption by senior executives, poor governance and infrastructure mismanagement have been a key characterising feature of the utility (Cowan, Masondo and Karrim, 2021). Corruption has been mostly noted through the awarding of suspect tenders to companies already tainted by misconduct (Cowan, Masondo and Karrim, 2021). An excellent example of such procurement irregularities can be seen in the building of Kusile Power Station, whose construction costs ended up exceeding the initial estimated cost by R83bn (Cowan, Masondo and Karrim, 2021). The result of this mismanagement of funds is the utility's entrenchment in debt totalling R411bn and old ill-functioning infrastructure leading to almost decade-long episodes of load shedding (Cowan, Masondo and Karrim, 2021). Eskom's failure to generate enough electricity and the expected decommissioning of approximately 24 100MW of coal power plants between 2030-2050 means that the supply of electricity will continue to be a challenge for the country (Integrated Resource Plan, 2019). The current and expected shortfall in overall electricity supply has led to increased talks about the reform of the utility by the current President, Cyril Ramaphosa. As such, in the past year (2021), the Minister of Finance noted the outdatedness of a vertically integrated electricity utility further highlighting the need for restructuring (Halsey *et al.*, 2019). Since then, the reform of Eskom namely into generation, transmission, and distribution segments has to date, been considered a crucial part of South Africa achieving its just energy transition (van Niekerk, 2019). Although this is the case, Geddes *et al.*, (2020) note that whilst the reform of the utility may be a more suitable approach for South Africa, it is important that the restructuring of Eskom be cognisant of the electricity prices to ensure affordability whilst also considering the impact on jobs.

2.3.4 Increasing share of renewables in country's energy mix

In response to the need to decarbonise the country's electricity sector and Eskom's electricity supply shortage issues, in the year 2011 the Department of Mineral Resources and Energy (DMRE) launched one of the world's leading clean energy initiatives known as the Renewable

Energy Independent Power Producers' Procurement Programme (REIPPP) (Baker *et al.*, 2015). The implementation of this programme was further made possible by the DMRE and National Treasury (NT) entering into a Memorandum of Agreement (MoA) with the Development Bank of Southern Africa (DBSA) (IPP Projects, n.d.). Though with significant room for improvement, the success of this programme is seen in the unprecedented inclusion of an addition of 20 000MW from solar and wind energy in the country's recent IRP. In sum, this will account for 25% of the total power generated in the year 2030 (Winkler, 2020). As with the global trend, the significantly cheaper costs of wind and solar-generated electricity compared to coal and nuclear have also been the basis of the increased investment in renewable energy in the country (Halsey *et al.*, 2019). Whilst the RE programme has to date announced its fifth bid round (Creamer, 2020), it is important to consider that the entrenched coal path dependencies are unlikely to result in the complete and sudden replacement of coal by renewables (Baker *et al.*, 2015). However, in the same breath, Rennkamp (2017) notes Renewable Energy programs to have become policy options that are implementable in middle-income countries endowed with fossil fuels, particularly when coalitions of powerful political actors are in support of them.

2.3.5 Justice in South Africa's Energy Transition

Whilst the country's democratic government has made notable progress regarding the provision of basic services to all, South Africa remains the world's most unequal society (Govender, 2016). As noted in the country's National Development Plan (NDP), high unemployment levels, inequality and poverty are the foremost developmental challenges that the country is faced with. Since these conditions are contrary to elements of the Constitution, questions of rights and social justice in the country remain of paramount importance (Govender, 2016). Additionally, South Africa's history of colonial and apartheid rule makes it imperative that all plans seeking to accelerate to a low carbon economy be inclusive, just, and sustainable (CIF, 2020). As a result, the just transition in South Africa embraces a much wider socio-economic focus (Winkler *et al.*, 2020). Creamer (2020) substantiates this by saying a "just" transition towards a low carbon economy in South Africa will have to happen alongside tackling the high inequality and poverty levels to ensure that historical injustices are not repeated. Because of this, "the concept of a just transition has appeared as a linchpin in the governments' communication around the future of the country" (Godinho, 2019). To date, South Africa is the only country that has included the Just Transition imperative in its NDC (Hirsch, Matthes, and Funfgelt, 2017).

Considering energy transitions inevitably producing and, in some instances, perpetuating pre-existing “winners and losers” (Carley and Konisky, 2020), transition pathways must acknowledge and address past, present and continued marginalization of certain groups in society. A failure to do this will result in increased vulnerability and resistance from those excluded from the benefits of the transition (CIF, 2020). The prevention of historical and present injustices by the current development path is further emphasized in the country’s latest IRP (2019) which envisions a completely different energy mix by 2030.

2.4 Conceptualization of Energy Transitions

Having understood what energy transitions are and the emerging need to include justice into the process, the question that now remains is how energy transitions have been conceptualised. In the past, energy transitions were simply depicted as the shift from one fuel source to another. Today, scholars argue against the reduction of energy systems to narrow configurations of energy technologies. Because of this, more emphasis has been placed on the role of social and institutional factors interacting with technical functions to ultimately shape the future of a system (Miller, Illes and Jones, 2013; Laird, 2013; Defeuilley, 2019).

2.4.1 Socio-technical transitions frameworks

Energy transitions have thus been mainly analysed through the lens of socio-technical transitions literature. A systemic review by Batinge *et al.*, (2019) revealed four main research strands that have been applied in the field of socio-technical transitions. These approaches have mainly been used as frameworks to analyse the dynamics of energy transitions across different scales. They include the Multi-Level Perspective (MLP), Transition Management (TM), Strategic Niche Management (SNM) and Technological Innovation Systems (TIS) (Batinge *et al.*, 2019; Defeuilley, 2019).

2.4.1.1 Multi-level Perspective (MLP)

Socio-technical transitions are commonly conceptualized using Geel’s Multi-level Perspective (MLP) (Batinge *et al.*, 2019; Defeuilley, 2019). The MLP “analyses transitions by the interplay of institutional structures and actors across three levels: niches (where new ideas/innovations develop), regimes (mainstream activities and structures) and the landscape (society trends and global changes)” (Geels *et al.*, 2017; Verbong and Geels, 2010; Defeuilley, 2019; Kaweesa *et al.*, 2020). Batinge *et al.*, (2019) review of the application of socio-technical transition frameworks revealed that the majority of these have been applied in European countries. Though Batinge *et al.*, (2019) question the applicability of these frameworks in the African

context, there is evidence of the use of these theories in this region. One such study uses the MLP to explain and understand Nigeria's renewable energy sustainability transition challenges (Ossunmuyiwa *et al.*, 2017). Similarly, amongst a range of other studies, Baker, Newell, and Phillips (2014) use the theoretical foundations of the MLP to expand on the political economy and governance of South Africa's energy transition. According to Kaweesa *et al.*, (2020), the MLP has also been recently used to understand sustainability transitions in food and agriculture systems.

2.4.1.2 Transition Management (TM)

Management is an important aspect of large system transitions. As a result, transition management (TM) serves as a proactive approach to managing and accelerating transitions in sectors like energy and water (Goddard and Ferrely, 2018). TM was developed in the Netherlands as part of the fourth Dutch National Environmental Policy Plan in 2001. Because of its deliberate influence on government activities to accelerate change towards sustainable ends, TM became accepted as a novel mode of governance for sustainable development (Loorbach and Rotmans, 2010). In the context of socio-technical transitions, the goal of TM is to develop policies that result in change towards innovation. As a result, the approach has been used to solve problems in the energy, water, construction, transport, and agriculture sectors that often cannot be solved by conventional means (Batinge *et al.*, 2019). In a recent study by Goddard and Ferrely (2018), the authors merged the TM approach with the just transition concept to create a "Just Transition Management Framework". This was applied as a tool to flag barriers to justice in the transition to renewables in Queensland, Australia.

2.4.1.3 Strategic-Niche Management (SNM)

SNM assumes the prevalence of more than one barrier working against the introduction and diffusion of alternative technologies (Kemp, Schot and Hoogma, 1998). As a result, SNM is about evaluating and monitoring the strengths and weaknesses of an emerging innovation/technology and contrasting it to existing market conditions (Batinge *et al.*, 2019). Conceptually, this occurs at the niche/micro-level of the MLP. Essentially, scholars in the SNM field analyse interactions between new technologies and existing systems to test their viability. This exercise provides insight into the conditions necessary for the successful emergence of a said niche/technology/innovation to overcome possible challenges and contribute to a shift in the current system (Thornton, 2016). To date, amongst many other studies, SNM has been used to study the introduction of bioenergy technologies in the Netherlands and Denmark (Raven, 2005) and to study the strengths and weaknesses of renewable energy initiatives in Omam (Al-

Sarihi and Cherni, 2018). SNM has also been used as an analysis to identify replicable success factors for the acceleration of concentrated solar power (CSP) projects in developing countries by comparing barriers to adoption in the United States and South Africa (Mirzania *et al.*, 2020).

While most studies have applied the SNM approach to the energy sector, some authors have used it in other sectors. Schilpzand and Raven (2010) demonstrated the usability of SNM in the ICT and privacy field whilst Susar, Hidalgo, and Chaironi (2019) applied it to the development of Eco-Industrial Parks.

2.4.1.4 Technological Innovation Systems (TIS)

Technological Innovation Systems (TIS) have been defined at different levels for varying purposes. TIS refer to “a network of actors and institutions that jointly contribute to the generation, diffusion, and utilisation of innovations” (Markard and Truffer, 2008). This approach focuses on the role of innovation systems in the development and growth of successful sustainable technologies (Defeuilley, 2019). As such TIS primarily focuses on understanding the dynamics of an innovation system including interactions between certain elements such as business, knowledge development, resources, institutions etc. (Defeuilley, 2019). The understanding of these dynamics is often centred around a specific technology (Markard, Hekkert, and Jacobson, 2015).

Whilst the TIS framework has been mostly applied in developed countries, Esmailzadeh *et al.*, (2020) reviewed the indicators specific to the functional analysis of innovation systems and modified them to be applicable in the context of a developing country. This was followed by an application of the modified framework to Iran’s photovoltaic renewable energy program to identify challenges.

2.4.2 Energy Transition Index (ETI)

Energy transitions have also been conceptualised using indicators. However, indicators generally trace specific parts of the energy transition, such as sustainability, access, energy security etc. (Singh *et al.*, 2019). Indices have been highlighted to be more composite tools. One such is the World Economic Forum’s (WEF) Energy Transition Index (ETI), which was developed as a decision-making tool for governments and businesses alike (Singh *et al.*, 2019). As a framework, the ETI scores countries on their system performance and transition readiness. System performance measures the maturity of a country’s current energy system to deliver across three imperatives namely, economic development and growth, environmental sustainability as well as universal access to a secure and reliable supply (Singh *et al.*, 2019;

World Economic Forum, 2019). Transition readiness, on the other hand, is about assessing the degree to which a country's decision-makers can implement strategies to deliver on system performance criteria. This is assessed based on several enablers i.e., the structure of the energy system, human capital and consumer participation, stability of regulation and political commitment, availability of capital to finance the energy transition, institutions and governance and infrastructure and innovative business environment (Singh *et al.*, 2019, WEF, 2019).

2.5 Conclusion

Much emphasis has been made on the challenges associated with a centralised fossil-fuel energy-producing system. The consensus in the literature on the issues associated with the current energy-producing regime provides evidence of the global reliance on fossil fuels continuing to be a much-contested topic in policy and politics in coming decades (Bloem, Swilling and Koranteng, 2021). Whilst the global response to this challenge has been the transition towards cleaner energy sources i.e., renewable energy, the need to ensure that the transition is just as noted in the burgeoning literature on energy justice necessitates a response to the call made by Williams and Doyon (2018) for transitions research to take justice into account. This means that much thought and enquiry needs to go towards understanding how the benefits of the transition are distributed (distributive justice), the participation of all in energy decision-making processes (procedural justice) and the need for due consideration towards rectifying past energy-induced injustices (restorative justice).

Whilst several authors have critiqued the MLP by highlighting its' lack of attention to actors and agency, Geels (2011) has countered this stance by attributing the alignments that occur within the three levels of the MLP during a transition to the interactions between social groups. This argument views actors as being embedded within structures whilst at the same time reproducing them. Thus, since much of the contestation regarding the energy transition occurs between actors, the researcher views the merging of the MLP and energy justice as an appropriate framework for exploring how central actors shape concepts of justice and injustice in the multiple levels (landscape, regime, and niche) of South Africa's politically contentious energy transition. According to Jenkins *et al.*, (2018), the merging of the two frameworks presents the argument that it is within the process of socio-technical transitions that issues of energy justice emerge.

Chapter 3: Methodology

Research can be defined as a scientific and systematic search for pertinent information on a given topic (Kothari, 2004). This search for knowledge generally “comprises of defining and redefining of problems, formulating hypothesis or suggested solutions; collecting, organising and evaluating data; making deductions and research conclusions” (Woody n.d. in Kothari, 2004). As such, this chapter aims to introduce and explain the methodology followed to collect and analyse data for the study.

3.1 Research Design

3.1.1 Qualitative Approach

Qualitative research is an approach aimed at the development of theories and understanding (Harding and Whitehead, 2013). As such, the qualitative approach is non-numerical, uses words and is descriptive. The relevance of this approach is in its ability to investigate the why and how of decision-making (Rajasekar *et al.*, 2006). Since qualitative research is mainly aimed at discovering the underlying motives and desires of human behaviour i.e., why, and how people think or do certain things (Kothari, 2004); qualitative approaches provide more in-depth information about the content, quality, meaning and changes of ties (Edwards, 2010). Thus, to investigate contestations amongst actors in the just energy transition as represented in the media, the study made use of a combination of systematic qualitative discourse and content analysis methods.

3.1.2 Discourse Analysis

According to van den Brink and Metze (2006) “discourse analysis is the examination of the argumentative structure in documents and other written or spoken statements as well as the practices through which these utterances are made”. In essence, discourse analysis is premised on the assumption that language “profoundly shapes our view of the world and reality, instead of being merely a neutral medium mirroring it” (van den Brink and Metze, 2006). Over time, language has been generally accepted to take the form of storylines and narratives which then become the medium through which actors provide meaning to the world around them (Bosman *et al.*, 2014). Thus, the expectation is that performing discourse analysis on a given topic would not only reveal the dominant discourse, but it would also highlight the varying and often competing political stances and realities (van Veen *et al.*, 2015), giving insight into relationships, power, and the cultural boundaries of society.

Because of the role of actors in past transitions and ‘transitions in the making’, the use of discursive approaches to determine positions and perspectives on sustainability transitions has gained significant traction (van Veen *et al.*, 2015). The momentum in the use of discursive approaches outlines the role of the “struggle over ideas’ in the policy process (Stone, 2012). Thus, the merit in the use of discourse analysis lies in its ability to unravel the inherent storylines embedded within and shaping transitions (Stone, 2012). Since socio-technical energy transitions inherently involve high degrees of policy uncertainty and political struggles over strategies, targets, and priorities (Isoaho and Karhunmaa, 2019), a qualitative discourse analysis will help to understand the contestations of actors shaping the just energy transition debate in South Africa’s electricity sector.

3.1.2.1 Frame Analysis

Both Carvalho (2000) and Jorgenson and Phillips (2002) agree that discourse analysis is not just limited to one standard method for examining texts. Because of this, there is also no clear consensus on how to analyse such texts. This means that there are multiple forms of going about it.

Frame analysis is one of the discursive approaches commonly used to understand and make sense of complex realities (Carvalho, 2000). In frame analysis, “scattered information is grouped under a subsuming category” (Carvalho, 2000), making it a useful analysis method for categorizing the differing sense of shared forms of understanding the world.

This research adopted the media/news frame analysis because of its relevance in the identification of contestations from:

- i) The views of interest groups, government, civil society pertaining to a specific issue and consequently,
- ii) The varying framings of the just energy transition debate in South Africa

Thus, the relevance of choosing the media as a medium of analysis as a method in this study stems from the media’s ability to both report on discourses and its role in creating them (Burgess, 1990 in Rose *et al.*, 2015). Thus, the analysis of media does not only highlight the existing discourses, but it can also reveal the manner of interaction between different actor groups in relation to a specific issue (Rose *et al.*, 2015). The application of discourse analysis (operationalized through frame analysis) is seen in a study by Rose *et al.*, (2015) wherein the authors analysed different frames (arguments) emanating from the contestations spurred by proposed changes to the urban edge and its implications for the Philippi Horticultural Area in

Cape Town, Western Cape (Rose *et al.*, 2015). The challenges, however, with the use of frame analysis are reliability and validity which are often a result of how the frames are operationally defined (Linstrom and Marais, 2012). The subjective process behind the identification of frames has also been flagged by Reese *et al.*, (2001). This can be circumvented by taking descriptive notes on the content whilst reading the articles, reading through the content again to identify recurring themes and concluding it by doing an in-depth interpretation of the articles (Linstrom and Marais, 2012).

3.1.3 Content Analysis

Content analysis is a technique that is aimed at describing, with optimum objectivity, precision and generality what is said on a given subject in a given place at a given time” (Macnamara, 2005). Lasswells (n.d. in Macnamara, 2005), echoes the same sentiment by describing content analysis as a method for examining who says what, through which channel and with what effect. Content analysis, therefore, involves systematically analysing textual data and making replicable inferences. According to Bengtsson (2016), content analysis can be used on all types of written texts with the purpose of organizing, gaining meaning and drawing realistic conclusions. Having evolved from strictly being a quantitative method, content analysis has become a flexible method for analysing text data and has been applied across a range of fields. Researchers have used content analysis to analyse semi-structured interviews, evaluated open-ended survey responses, analysed government plans and reports to answer a multiplicity of research questions (Kleinheksel *et al.*, 2020). Majority of content analysis applications have been seen in the political science to either identify trends and patterns in documents, determine authorship or monitor shifts in public opinion (Stan, n.d). This method has also been applied in business management to assess the attention of top managers in companies on the brink of bankruptcy. This was done by analysing letters sent to shareholders by senior managers of bankrupt firms and surviving firms wherein a comparison between the two letter categories was done (Stan, n.d). The most prevalent challenges cited in literature about content analysis include its time-consuming and labour-intensive nature (Wilson, 2011) and the varying methodological challenges such as the multiple ways to define meaning. This challenge can, however, be overcome using coding (Kleinheksel *et al.*, 2020).

3.2 Methods

This section gives an overview of how the author operationalised each of the qualitative mixed methods approaches described above. This is also depicted in the figure 1 below and elaborated on from section 3.2.1 onwards.

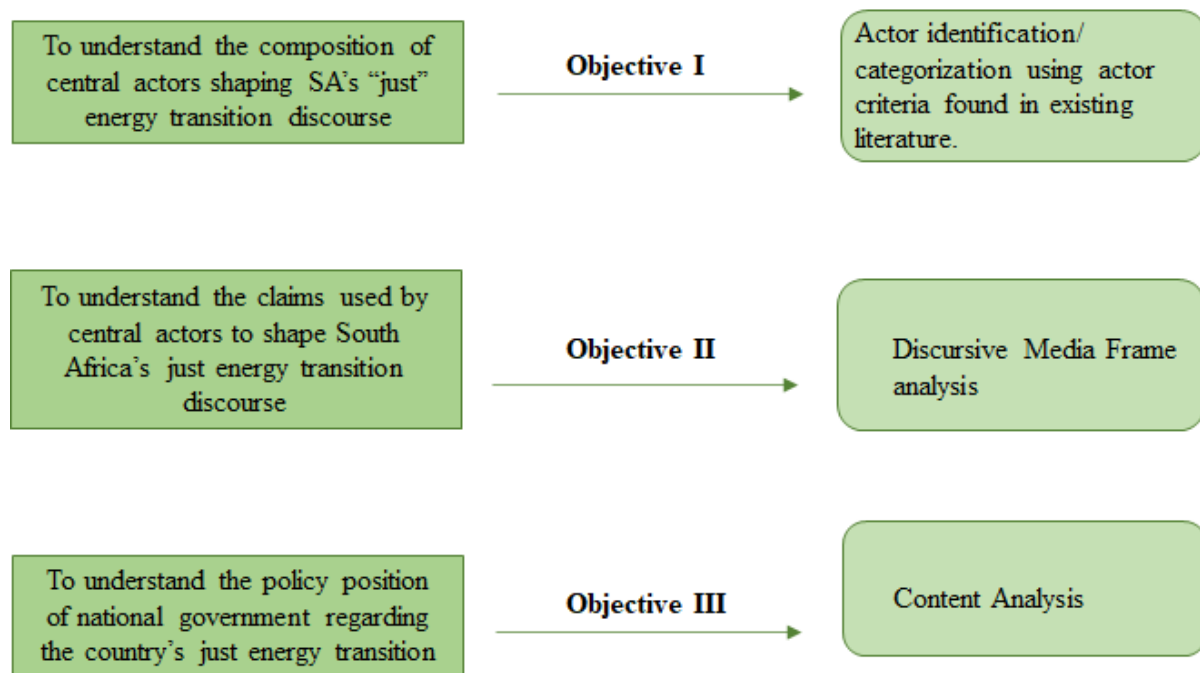


Figure 1: Data Collection & Analysis Framework

3.2.1 Objective 1: Actor categorization

The purpose of the actor categorization was to identify the central actors across the three levels of the MLP that shape the country's just energy transition discourse.

3.2.1.1 Data Collection

Step 1: Using the (energy AND transition) Boolean phrase, online newspaper articles were collected as the main medium of analysis for the study. These were retrieved from the Sabinet SA Media database. Articles were filtered and downloaded by publication year from the year 2010 to mid-2021. Each year's results were sorted in ascending order by publication date so the researcher would be able to systematically trace the role and actions of actors in each year across the 11 years. The length of the study period is justified for two reasons. Firstly, according to Essex and de Groot (2019), from a policy perspective; the period from 2011- represents the beginning of South Africa's "climate change and renewable energy" phase.

Secondly, Mazmanian and Sabatier (1983) recommend that to enable policy-oriented learning, then the implementation must at least span across ten years.

Newspaper articles were sourced from a range of publications namely, Star, Cape Argus, Cape Times, Business Day, Pretoria News, Daily News, City Press, Mail & Guardian, Saturday Argus, Independent on Saturday, Citizen on Saturday, Citizen, Dispatch Live, Sowetan, Sunday Tribune, Sunday Independent, Sunday Argus, Leadership SA, Witness, The New Age, Diamond Field Advertiser and Farmers Weekly.

Whilst the initial search yielded 2595 results across the 11 years, the researcher only downloaded articles with keywords related to the energy transition such as climate change, energy transition, just transition, just energy transition, renewable energy, solar, wind, Eskom, etc. During the development of the actor categorization database, articles were read to determine their relevance (see section 3.2.1.2 below). This exercise led to articles being streamlined further, resulting in a sample size of 375 articles.

3.2.1.2 Data Analysis

Step 2: Once downloaded, the researcher read through the articles and placed each actor according to a colour-coded actor category in an excel spreadsheet. Each actor was recorded with their accompanying arguments, statements, claims, (to be used for the frame analysis). These were either quotations or statements made by the identified actor (across the study's selected time period), or statements made by the author in reference to the identified actor. **Identified actor categories include the government (state actors), utility (Eskom), users, academia, labour, civil society, business, and renewable energy industry associations.*

Step 3: Once actor categories were identified, based on Miles and Huberman's (1994) coding approach; the second level of coding was conducted. This entailed further categorising the identified actors in relation to the levels of the MLP i.e., landscape, regime, or niche actors. The criteria for identifying each actor across this hierarchy is highlighted in the table below.

Table 1: Actor identification/categorization criteria

Actor category:	Identification criteria:
Landscape Actor	*Exogenous sources of change such as public awareness, government commitments, changes in international economic, political, and financial situation (Fischer and Newig, 2016).
Regime Actor	Based on the regime membership concept highlighted in Smith, Stirling and Berkhout (2005) actors will be delineated across the core, non-core, and outside/external actor categories (described in the analysis and discussion – chapter 4).
Niche Actor	Niche actors will be identified based on their involvement in experiments for systemic change and radical innovations (Geels and Schot, 2007).

*The landscape is the level with no agency i.e., no actors.

3.2.1.3 Limitations

Due to the author affiliation and general political position of some newspapers, the selected discourse within the news articles may contain a level of bias thus rendering them unreliable sources (Michigan, 2014 in Hamborg *et al.*, (2017). The second limitation is the researchers' self-determined codes and actor categories for the first cycle coding. This is a limitation because it may prevent the study from being replicable. Lastly, because of restricted access to articles from other publications within the SA Media database, the results of the study may not include all relevant information pertaining to an identified actor.

3.2.2 Objective 2: News/media frame analysis

The purpose of this exercise was to identify the dominant frames that emerge from central actors within South Africa's energy transition discourse.

3.2.2.1 Data Collection

To identify the dominant frames in the energy transition discourse, the researcher sourced and grouped similar keywords, statements and phrases used by actors across the identified actor categories. This was to ascertain the underlying narratives and storylines held by various actors.

To further enrich the results of the study, session recordings of the meetings held by the Presidential Climate Commission (PCC) between April 2021 – July 2021 were analysed. The Commission was established by the President in 2019 to provide recommendations on the country's just transition framework (Patel, 2021). Thus, the researcher found these recordings

relevant from a comparative analysis perspective because they are recent in nature and consist of actors representing different interests and views about justice in the country’s energy transition. All meeting recordings were sourced from the Commissions’ Facebook page.

3.2.2.2 Data Analysis

In terms of the analysis, the researcher colour-coded similar phrases, keywords, and statements across each actor category. Frequently emerging phrases, paragraphs or statements were grouped into the same category and used for the analysis.

For the Commission recordings, the researcher listened to all five sessions and transcribed the statements made by actors corresponding to the previously identified actor categories. To identify the dominant frames, statements and phrases that emerged frequently or had similar sentiments were grouped into the same category. See table 2 below for the list of the meeting recordings utilised for this part of the analysis.

Table 2: Presidential Climate Commission Meetings

Date:	Meeting focus:
30 April 2021	2 nd Meeting of the Presidential Climate Commission.
07 May 2021	Presidential Climate Change hearings on the NDC’s (Part 1 and Part 2)
20 May 2021	Presentation of NBI modelling work on the Just Transition to the Presidential Commission.
04 June 2021	Special Meeting of the Presidential Coordinating Climate Change Commission to consider draft NDC and formulate recommendations.
30 July 2021	Meeting of the Presidential Climate Commission on Just Energy Transition

3.2.2.3 Limitations

Again, due to the lack of access to all relevant news articles – it may be that the frames of some of the authors may not be accurately captured. Secondly, since the PCC meetings analysed were only those for the first half of the year 2021, the identified frames may not be indicative of all the existing frames in the just energy transition space.

3.2.3 Objective 3: Understanding national policy position on the country's just energy transition

3.2.3.1 Data Collection

To understand the policy position of the national government on the country's just energy transition, this study made use of keywords-in-context (KWIC) across three key national documents (data sources):

- Integrated Resource Plan (IRP) (2019)
- Low Emissions Development Strategy (LEDS) 2050
- Updated Nationally Determined Contribution (NDC) (2021)

The selection of these documents was based on their prominence as guideline policy documents in the country's energy transition.

3.2.3.2 Data Analysis

The main purpose of keywords-in-context (KWIC) is to “determine how words are used in context with other words” (Onwuegbuzie *et al.*, 2009). This makes KWIC a valuable tool for ascertaining meaning in the text. Using Nvivo, the main keywords used to conduct the keywords-in-context (KWIC) search were restricted to “just energy transition/s”, “energy transition/s”, “just transition/s”, “electricity transition/s”, and “socially just transition”. Because the objective was to understand the governments' policy position on the country's just energy transition, each of the keywords were searched across each national document.

3.2.3.3 Limitations

Whilst this exercise was useful in identifying the varying contexts under which each national document refers to the just energy transition, a general limitation of conducting keyword searches is often the possible omission of related words which means that the researcher may miss relevant information. To prevent this, multiple just transition-related keywords were searched across the documents. This was done using the exact match function.

Chapter 4: Analysis and Discussion

This chapter presents an analysis primarily aimed at answering the main research question i.e., how central actors shape concepts of “justice” and “injustice” in the multiple levels of South Africa’s energy transition. Guided by figure 2 below as an analytical framework, the analysis will begin by identifying the landscape developments putting pressure on the country’s electricity coal-producing regime. This will be followed by the socio-technical regime, niche, and policy analysis respectively. Each subsection of the analysis is accompanied by a discussion.

4.1 Analytical Framework

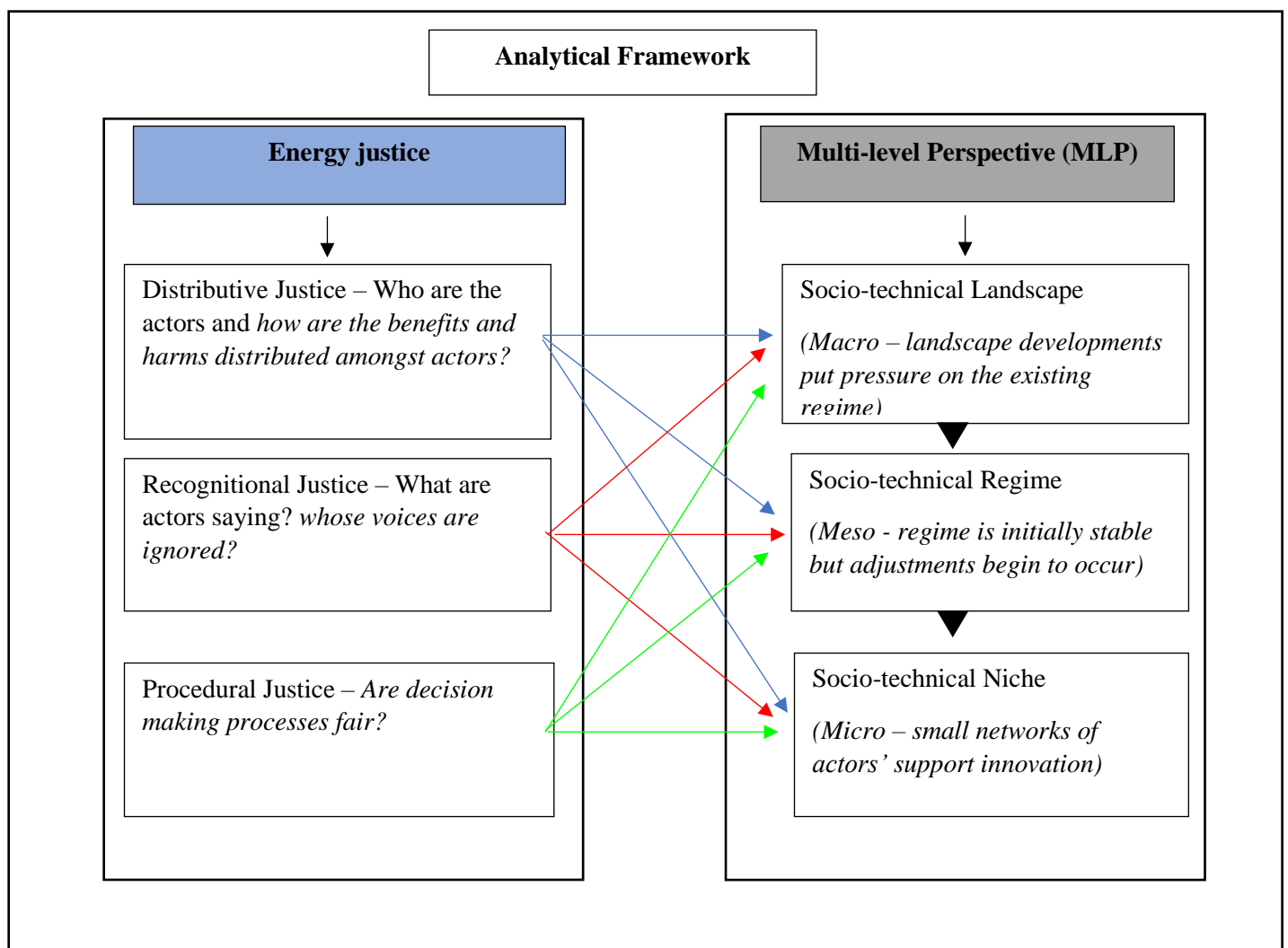


Figure 2: Analytical Framework

Whilst the core MLP tenets of explaining how socio-technical transitions occur will serve as the basis for the analysis of the results of this study, to make it more relevant to South Africa's developmental status, the proposition made by Jenkins *et al.*, (2018) to explore the MLP on socio-technical transitions by integrating it with the energy justice framework has been adopted. The adoption of the repurposed above analytical framework takes into consideration Verbong *et al.*, (2010) in Hansen *et al.*, (2018) warning against the act of replicating theoretical and conceptual frameworks from their place of origin to significantly different empirical contexts. Thus, for the benefit of the actor-centric approach being followed in this study and the developing country context of South Africa, the framework was used to ascertain how actors shape concepts of justice in South Africa's energy transition.

4.2 Socio-Technical Landscape - Analysis and Discussion

As alluded to, "the socio-technical landscape of a society provides a broad canvas on which multiple regimes lie" (Andrews-Speed, 2016). Because the landscape is an external structure, it often consists of a set of deep structural trends such as geographies, demographic, political, economic, and industrial attributes of society (Morene *et al.*, 2015). Changes that occur at the landscape level create pressure on the regime which is often the dominant technological configuration (Konefal, 2015; Morene *et al.*, 2015). As such, this analysis aims to provide an overview of the main landscape pressures that have been influencing South Africa's energy transition over the chosen study period.

4.2.1 Landscape developments placing pressure on South Africa's energy regime

Following the assumption in literature which views the landscape as a background level with no activity i.e., one that regime actors and niche actors cannot influence in the short term but merely respond to (Geels and Schot, 2007). The analysis revealed three key landscape pressures influencing South Africa's coal-based electricity production regime.

Climate Change:

The most dominant landscape development placing pressure on the country's electricity regime as revealed by the analysis is the **climate change** phenomenon (*Star*, 05 January 2010; *Star*, 05 August 2011; *The New Age*, 23 June 2014; *Cape Times*, 10 June 2015; *Cape Times*, 18 May 2017; *Witness*, 01 May 2019). Due to the impending global focus on climate change, in the year 2010, businesses in South Africa became "under increasing pressure to treat sustainability as a business imperative" (*Star*, 05 January 2010). This pressure was mostly a result of the tightened pollution laws, increased call for sustainability to be included in business models and

the introduction of environmental taxes (*Star*, 05 January 2010). This is also the same year that the Intergovernmental Panel on Climate Change (IPCC) called on all “developed and developing nations to reduce their emissions to between 25% and 40% and 14% to 19% respectively” (*Star*, 05 January 2010). As a consequence of being a signatory of the United Nations Framework Convention on Climate Change (UNFCCC) (*City Press*, 13 December 2015), the South African government repeatedly confirmed its commitment to carry out its responsibilities within the framework and its recognition of the “grave impacts posed by climate change to the country’s sustainable development” (*Star*, 09 December 2010; *Star*, 03 November 2011). To further highlight the extent of climate change acting as a landscape pressure on the country’s energy regime, as a signatory to the UNFCCC, South Africa has a range of obligations to fulfil, and these include: (National Climate Change Response Strategy, 2004).

- i. “Promoting and co-operating in the development, diffusion of technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases” and
- ii. “Formulating and implementing national, and where appropriate, regional programmes to mitigate climate change and facilitate adequate adaptation to climate change”.

In an article written in the year 2011, a divisional executive for system operations and planning at Eskom said that “it is clear that carbon constraints and climate change mean a change in the generation mix of South Africa and a move away from coal in favour of low-carbon technologies” (*Star*, 10 February 2011). This statement echoes similar sentiments as the above obligations which highlight UNFCCC member obligations that inevitably have an impact on a country’s energy regime. Furthermore, the analysis also revealed South Africa’s commitment to climate action to be fuelled by two main drivers. As highlighted by the International Energy Agency in 2010, South Africa was the world’s 13th highest emitter of carbon dioxide (*City Press*, 12 December 2010). To date, the country has been ranked as one of the worst G20 performers in terms of carbon intensity, maintaining its status as one of the world’s biggest GHG emitters (*Sunday Tribune*, 07 February 2021). This places an even heavier obligation on the country to reduce its emissions so as to reduce its contribution to climate change.

The second driver appears to be the country’s recognition of the potential of climate change to “completely undermine its developmental and economic gains” (*Star*, 09 November 2011; *Star*, 23 September 2011; *Mail & Guardian*, 22 March 2012). The cross-sectoral impact of

climate change was highlighted by the then Environmental Affairs Minister, Edna Molewa when she said that “here in South Africa, we know that if nothing is done swiftly and concretely to respond to the challenge of climate change, the effects on agriculture, health services and the economy, in general, will dent our development prospects and further exacerbate the problem of poverty” (*Star*, 23 September 2011). The wide-ranging impact of climate change on the country’s development objectives is one of the reasons why the phenomenon is often described as having the ability to undermine the “efforts of millions of people to escape poverty and hunger” through its’ exacerbation of inequality (*The New Age*, 23 June 2014). These are two factors that make the country both a major contributor and victim to climate change.

As revealed in the Presidential Commissions meetings, climate change remains the core reason behind the country’s continued efforts towards curbing emissions. Quoting the President of South Africa, Department of Fisheries, Forestry and Environment, Minister Barbara Creecy opened her speech by highlighting that whilst the country battled with the COVID-19 pandemic, climate change remained a national priority. She not only emphasized the need for South Africa to contribute to the reduction of global emissions – but she also expressed the limited timeframe in which the country had to achieve this (PCC meeting, 30 April 2021). At a later PCC session, President Ramaphosa added that achieving the reduction in global emissions meant that the country needed to set “bold and clear goals for climate change” (PCC meeting, 30 July 2021).

[International Climate Regime \(UN Climate Negotiations, Paris Agreement\):](#)

Linked to climate change, the other key factor emerging as one of the landscape development pressures on the country’s electricity regime is the series of United Nations Climate Negotiations including the 2015 Paris Agreement (*Star*, 17 January 2011) that South Africa has been a part of. The impacts of climate change on Southern Africa have made it essential for the region to “remain engaged in UN negotiations while pressing ahead with domestic policies to support the uptake of renewable energies” (*Star*, 17 January 2011). This finding is supported by Newell and Bulkeley (2016) who identify the development of national policy responses and mechanisms of technology transfer as some of the ways in which the international climate regime has been shaping the route towards global mitigation. Similarly, Essex and de Groot (2019) note external pressure from the international community as one of the propelling reasons behind government’s adoption of renewable i.e., transitioning from fossil fuels. To date, South Africa is the only African country that has hosted a UN Climate Change Conference (pending COP27 in Egypt later this year). The hosting of this conference

is a feat that the Environmental Minister saw as a “unique opportunity to mobilise society around objectives of the national response and raise climate awareness” (*Star*, 23 September 2011). Whilst the hosting of the 17th Conference of Parties (COP17) by South Africa was a landmark event (*Star*, 05 August 2011; *Leadership SA*, 01 October 2011), the 2015 Paris Agreement is highlighted as the key climate action facilitator for South Africa because it meant that the country had to begin “ridding itself of its coal addiction” (*City Press*, 13 December 2015). This is an obligation that rests on the country because of the need for every UNFCCC member that ratified its commitment to the PA to submit Nationally Determined Contributions (NDC’s) (*The New Age*, 18 January 2018). NDC’s are found in Article 4 (paragraph 2) of the Agreement, and they essentially refer to country-specific efforts to reduce national emissions and adapt to the impacts of climate change (UNFCCC, 2021). Leading up to the Agreement in 2015, Environmental Affairs Minister, Edna Molewa said “with the Paris Conference, we have within our grasp the will to set the development of a fair, ambitious and legally binding multilateral global climate change system that supports the transition to lower-carbon and climate-resilient economies” (*Sunday Independent*, 26 July 2015). Thus, at the landscape level (mesoscale), the Agreement is the world’s new global approach to climate change (*The New Age*, 18 January 2018). Because of the Paris’ Agreements goal of keeping the global average temperature to 1.5°C, the policy brought all nations into a common cause of action to collectively address the threat of climate change (Department of Environmental Affairs (n.d.).

Before and during the hosting of the 2011 climate change conference negotiations, South Africa; through the participation of Ministers of environment of the BASIC countries was also a key player in international talks related to the fate of the Paris Agreements predecessor, the Kyoto Protocol (Hochstetler, 2012). As with the Paris Agreement, the Kyoto Protocol was a UNFCCC mechanism aimed at reducing air pollution in response to the changing climate. However, unlike the Paris Agreement – under the Kyoto Protocol, the responsibility to reduce emissions rested only on the developed nations (*Star*, 23 September 2011).

Declining Global Coal Demand:

The third identified landscape development pressure that has an impact on South Africa’s electricity regime is related to the trend of the declining demand for coal, globally. In the year 2015, globally renowned businessman Michael Bloomberg highlighted that the coal industry had been on a steady decline for close to a decade citing market forces, technological advances and public demands for cleaner air and action on climate change as the main reasons behind the decline (*Pretoria News*, 06 August 2015). The analysis revealed further key activities that

may place even further pressure on the stability of the current regime and that is the increasing momentum in divestment activity away from fossil fuels (*The New Age*, 01 September 2015) as well as the announcement by UN Secretary-General Antonio Guterres that urged countries against the construction of new coal-fired power plants, emphasizing the need for a shift from the grey to the green economy (*Saturday Star*, 07 September 2019). The resultant implication on the country has been even more pronounced calls for South Africa to wean itself from its “coal addiction” (*City Press*, 13 December 2015). To date, because of the gradual strengthening of carbon reduction policies by major global coal consumers, South Africa’s coal exports have been said to be approaching a long-term decline (*Star*, 17 September 2019; *Citizen*, 17 September 2019). This is corroborated by Nicholas and Buckley (2019), who state that most of South Africa’s major export markets are already showing signs of a transition away from coal. One such example is India’s coal ministry which has plans to cut coal imports by one-third which would be around 85million tonnes (Mt) by 2024. Considering that South Africa receives a significant portion of revenue from coal exports (R61bn in 2017) (Huxham, Anwar and Nelson, 2018), as the main coal export partners continually enact low-carbon policies, the “South African coal exporters are likely to seek alternative markets” (Nicholas and Buckley, 2019). However, this will still conflict with the forecasted approaching long-term decline in coal-fired produced electricity.

Of importance, the analysis also revealed that in 2019, the CEO of one of South Africa’s large coal mining company Mark Cutifani was quoted saying “Anglo American probably won’t invest in new thermal coal mines in South Africa as energy transition leads to more volatile prices” (*Citizen*, 03 October 2019). Cutifani’s statement, which is synonymous with a declining appetite for coal represents a significant threat to the stability of the country’s coal dominated electricity-producing regime.

At the opening of the Presidential Commissions meeting held on the 30th of April, the Deputy Chairman Mr Valli Moosa brought to the attention of the rest of the Commissioners the global trend of global banks and asset managers forming net-zero targets. This means that countries that still possess a large appetite for fossil fuels such as coal in the near future will likely not have access to capital markets (PCC meeting, 30 April 2021). This highlights the need for the country to take advantage of alternative energy sources apart from coal as this resource stands the risk of becoming stranded.

4.2.2 “Justice” concerns at the landscape level

The MLP logic is that deviations from current regimes are prompted by landscape pressures aimed to foster change towards sustainable energy practices. As previously mentioned, the landscape scale has been conceptualized as lacking agency i.e., does not allow for the identification of actors (Raven *et al.*, 2012). Whilst this logic has been followed in sub-section 4.2.1 (identification of landscape pressure developments), the analysis revealed contestations between developed and developing nations that are worth being noted as they bring up questions of fairness and equity in climate negotiations. During the year 2010 at the Cancun negotiations, the debate on the continuation of the Kyoto Protocol revealed two diverging stances. “Developing nations were united in seeking its continuation” whilst developed nations preferred the development of a new agreement, alongside developing countries (*Star*, 05 January 2010). In essence, developing nations accused developed nations of shifting the burden of action away from themselves (*Star*, 05 January 2010). Developed nations on the other hand remained unmoved on their position stating that large developing country emitters such as China, India, and South Africa must contribute to global mitigation efforts (*Star*, 17 January 2011). As evidenced in this interaction, international negotiations about climate change raise questions on how to apportion the responsibility for addressing the climate problem among states (Hochstetler and Milkoreit, 2014). Seeing that the reasons behind the contestation stem from each of these parties seeking to protect their economic positions, it seems plausible to deduce that climate negotiations bring up questions of both distributive and procedural justice. It can be argued that the insistence by developed nations for developing nations to participate in the mitigation reduction efforts negating its historical responsibility raises issues of supremacy by one group over another in the climate negotiation regime (Ulgen, 2021). The current state of climate change regulations mirrors the inequalities between industrialised and developing nations (Rennkamp, 2019: b). Whilst the emerging nations have in the past responded to this by forming the BASIC coalition (Brazil, South Africa, India, and China), the lack of a defined coalition identity resulted in its fracture (Hochstetler and Milkoreit, 2014) as a result of South Africa and Brazil opting for higher ambition – contrary to China and India (Ulgen, 2021).

The result of such contestation of course tends to lead to a sense of mistrust between negotiating nations. For instance, after Minister Creecy gave an overview of the UK climate summit she attended with the President. Presidential Commission Deputy Chairperson Valli Moosa sought the Ministers view on the overall seriousness this time round of developed nations who are of

course viewed as responsible for large atmospheric concentrations. It appears that this is a question that the Chair asked to get a sense of the level of commitment of large emitters such as the United States of America (USA) who in the past have reneged on their commitments to emissions reduction to the extent of exiting the Paris Agreement (PCC meeting, 30 July 2021).

4.2.3 Discussion

Looking at the three key landscape themes identified above, it is evident that climate change and the accompanying international regime for climate policy has and will continue to influence further global decarbonization policies and country-specific embryonic transitions (Newell and Bulkeley, 2016). What is also evident is that both the identified sub-themes i.e., UN-Negotiations (Paris Agreement) and the declining coal demand are a consequence of the need to respond to the impending threat of climate change. This identifies climate change as the landscape pressure guiding national level climate-related action (as evidenced in South Africa's commitments to climate negotiations and targets above). This finding coincides with Paredis (2013) who also identified climate change as being one of the key landscape factors in the context of transitions. Collectively, however, all three landscape themes can be viewed as the wider context that impacts South Africa's electricity regime system. This shows the importance of landscape-level inducements in the development of all transition pathways. According to Geels *et al.*, (2017) and Geels and Schot (2007), landscape pressures achieve this by putting pressure on the regime and opening opportunities for innovation (niche development).

Again, as evidenced in South Africa's role in fulfilling, for instance, its UNFCCC mandate and subsequent setting of its first Intended Nationally Determined Contribution (INDC) in 2015 (CSIR, 2015); it is clear that landscape-level pressures form the boundaries within which action has to occur. In other words, this corroborates the understanding that actors in the regime and niche merely respond to landscape-level mechanisms and cannot influence them. According to Van Der Merwe (2017), this plays itself out in the landscape pressures providing stability to the regime level by shaping development trajectories and through easing the red tape around innovation adoption at the niche level.

Lastly, whilst landscape pressures can either be unintentional or intentional, all three identified sources of landscape pressure can be classified as intentional. Morene *et al.*, (2015) describe intentional sources of pressure as those that are either deliberately exerted by stakeholders to induce a misalignment between landscape factors and socio-technical regime, or it can result

from instances where global actors influence change at the regime level by encouraging policies through multi-lateral development mechanisms. Though unconventional, this study has also managed to highlight justice considerations that emerge as a result of interactions between developed and developing countries in the international climate regime. Contestation in this regard appears to be the result of justice and equity concerns that emerge due to the unevenness in countries emissions and subsequent burdens to respond to climate change (Ulgen, 2021) which presents a case for distributive justice concerns at the landscape level of South Africa's transition. To some extent, one may even attribute the contestation between developed and developing countries to issues of fairness which speaks to procedural justice.

4.3 Socio-Technical Regime - Analysis and Discussion

This section of the analysis expands on the dynamics of the country's mesoscale socio-technical regime level. In the context of this study, the regime refers to the country's coal-producing electricity system. According to Rip & Kemp (1984) in Simmie (2012), the regime often includes the infrastructure, the rules guiding it and scientific knowledge supporting it, skills and procedures that sum up the totality of the system.

In line with the objectives of the study, the analysis begins by providing an overview of regime actors followed by three sub-sections that elaborate further on the actor frames shaping the "just" energy transition discourse in South Africa. Where feasible, the identified frames will either fall into *factors contributing to regime stability* or *factors contributing to regime destabilization*. The third category of frames will be related to the justice-related concerns identified by the actors.

4.3.1 Actors in the regime level – *Regime membership*

Regime actors were identified using Smith, Stirling and Berkhout's (2005) concept of regime membership. Regime membership delineates actor boundaries according to "the degree to which different actors participate in carrying out functions reproducing the regime" (Smith, Stirling and Berkhout, 2005). As such, regime actors were divided across three main categories, the core/incumbent actors, non-core actors and external (outside) actors. These are elaborated on below:

Table 3: Core/incumbent actors

Actor category:	Actor/Member:
Incumbent/Core actors:	<ul style="list-style-type: none"> • Eskom (utility) • National Energy Regulator of South Africa (NERSA) • State (Department of Energy/ Department of Mineral Resources & Energy (DMRE), National Treasury) • Business/users: Energy Intensive Users Group (EIUG), Business Unity South Africa (BUSA), Chamber of Mines, Minerals Council South Africa • Labour: Congress of South African Trade Unions (COSATU), Association of Mineworkers and Construction Union (AMCU), The National Union of Metalworkers of South Africa (NUMSA)

Core/incumbent actors represent members of the regime who are key players in the reinforcement of the status quo i.e., the current coal electricity-producing system. In other words, core members consist of actors who are beneficiaries of the outcomes of the regime (Smith, Stirling and Berkhout, 2005). In this instance, the analysis identified four main groups that fall under the core/incumbent actor category. These include Eskom, the state (represented by the electricity regulating body (NERSA) and various government departments), players from the business sector (large energy users, industry associations) and labour (trade unions).

The main reason why **Eskom** emerged as an incumbent actor in the regime is that the utility is responsible for a significant portion of the generation of coal-generated electricity, transmitting, and distributing it to industrial, mining, commercial, agricultural, and residential customers (Department of Energy, 2019). It is unsurprising then that, in the past decade – the utility has been involved in activities that have been contributing to the perpetuation of the coal-producing electricity system regime. The first feature emerging from the analysis that supports this is seen in the utility’s commitment to coal-powered electricity generation through its New Build Programme (*Daily News*, 21 January 2010). To sustain this program, Eskom

continually applies to the country's energy regulator for increased tariff prices (*Star*, 05 January 2010; *Daily News*, 25 October 2012; *Star*, 14 August 2014; *The New Age*, 14 May 2015). The utility has also been supporting its coal expansion program through seeking financial bailouts from the South African government (mainly National Treasury) and international sources such as the World Bank (*Star*, 08 March 2010 (a, b)). The utility's expansion programme has not been welcomed by all parties as environmental groups have rejected its rationality citing the large contribution of coal-fired power stations to emissions (*Daily News*, 21 January 2010). Furthermore, in 2016, Eskom CEO Brian Molefe refused to sign power purchase agreements (PPA's) with Independent Power Producers (IPP's) for close to a period of two years, stalling the renewable energy adoption process (*City Press*, 06 November 2016). Although Eskom is an incumbent regime player, in the year 2020; the current CEO Eskom Andre de Ruyter was quoted saying "Eskom fully recognizes that it has a negative impact not only on the world but on South Africa" (*Citizen*, 24 April 2020). However, de Ruyter cautioned that it was "unlikely for the country to back out of coal overnight" (*Citizen*, 24 April 2020). Through its' Just Energy Transition programme, the utility also acknowledges the importance of "creating alternative employment through the repurposing of its old coal-fired power stations" (*Citizen*, 06 November 2020). As such Mandy Rambharos, the Head of the utility's first of its kind Just Energy Transition office views the closure of old coal-fired power stations by the utility as a positive contribution to the country's NDC target and Paris Agreement (*Mail & Guardian*, 12 March 2021).

According to Baker and Phillips (2019), over and beyond approving licenses for electricity generation, distribution, and transmission. The **National Energy Regulator of South Africa (NERSA)** is also mandated to set the tariffs at which electricity is sold. This includes the rate at which Eskom sells electricity to end-users (Baker and Phillips, 2019). In keeping with this, the analysis revealed NERSA's role of approving tariff applications by Eskom over the study period as a regime enforcing activity (*Saturday Argus*, 11 August 2012, *The New Age*, 06 August 2014, *The New Age*, 14 May 2015). What is important to note, however, is that because of Eskom's frequent application for tariff increases, NERSA has on occasion refused to approve significant tariffs requested by Eskom (Baker and Phillips, 2019). For instance, when Eskom applied for a 16% tariff increase for the next five years in 2014, NERSA approved only half of what the utility had requested. This is an occurrence that has happened more than once highlighting the important role that NERSA must fulfil in balancing both the interests of licensed entities and end-users (NERSA, 2014).

As a policymaker, the **State** (through various national government departments) has also emerged as one of the core regime actors. Whilst the various Ministers of the **Department of Energy (DoE)** (now the Department of Mineral Resources and Energy) have emphasized the importance of the country committing to increasing the country's energy mix to include a significantly large portion of renewable energy sources (*Witness*, 2 December 2011; *Cape Times*, 06 October 2015), the department has also been quoted saying opposing statements which confirm the salience of coal over all energy sources in the country's energy mix. One such instance is when the then Minister, Susan Shabangu reassured the audience at a coal mine conference that coal was and remained the basis of South Africa's competitive energy supply (*Cape Times*, 06 February 2014). Similarly – in 2019, Minister Mantashe reaffirmed the role of coal in the country's energy mix, saying that “we are cautioning people who say coal is coming to an end” (*Sunday Tribune*, 20 October 2019). Whilst the **National Treasury** appears to have been instrumental in market instruments to regulate emissions, in the year 2010 Minister of Finance Pravin Gordhan said “to sustain the growth rates that we need to create jobs, we have no choice but to build new generating capacity – relying on what for now remains the most abundant and affordable energy source – coal” (*Star*, 25 March 2010).

The third group of actors that have been identified as core-regime members includes the business sector namely large energy users (**EIUG**), **Business Unity South Africa (BUSA)**, **Chamber of Mines, and the Minerals Council South Africa**. Large businesses typically fall under this group because firstly, they tend to be direct beneficiaries of the regime. In this case, for instance, the country's energy-intensive users who consume just over 40% of the country's electricity were granted “special price agreements” by Eskom in the 1990s due to overcapacity (Baker, 2017). According to Burton, Lott and Rennkamp (2018), support for the extractive sectors such as coal through subsidies has been sustained by the view of such sectors being key to economic development. Within or during a transition, such practices are those which perpetuate carbon-lock-in. In response, environmental groups and trade unions alike have condemned the existence of these price agreements, labelling it as unjust (*Daily News*, 21 January 2010; *Star*, 12 March 2010; *Sunday Independent*, 27 November 2011). Secondly, as revealed by the analysis, large users have on varied occasions expressed their displeasure with the premature release of the country's first National Climate Change Response White Paper. Another instance is when members of business watered-down South Africa's contribution to global emissions. For instance, in 2013; BUSA said “there is no need for South Africa to take a lead in climate change mitigation” (*City Press*, 08 September 2013). The basis of this

statement appears to have been based on the view that the country contributes a small proportion to the world's overall GHG emissions (*Star*, 09 November 2011; *City Press*, 15 December 2013), thus supporting the idea of the country negating its efforts towards reducing emissions. The analysis also revealed businesses' opposition to the carbon tax. Both BUSA and the country's second-largest emitter **Sasol** (a member of BUSA) noted that whilst they were ready to comply with the carbon tax, they had reservations with the carbon tax policy in its current form (*Mail & Guardian*, 15 March 2019). The **Minerals Council South Africa** on the other hand explicitly stated that it was opposed to the carbon tax in its current form, highlighting that the country was likely to achieve its Paris commitments without the implementation of the tax (*Cape Times*, 23 September 2019). Whilst the operations and stances of the Business sector have landed them in the core/incumbent actor category. In 2019, BUSA urged the Minister of Energy Mr Mantashe to launch the new round of procurement for Renewable Energy with urgency (*Mail & Guardian*, 29 November 2019). Similarly, during one of the PCC meetings, BUSA CEO Mr Cas Coovadia expressed that business acknowledged that inaction towards climate change and the just transition was unacceptable and further went on to state businesses' support of the advancement of enhanced renewable energy and green hydrogen technologies (PCC meeting, 07 May 2021). Business emphasized this position in a statement released in August 2021, which not only noted its acknowledgment and support for a more ambitious NDC but also unequivocally committed to supporting the country's commitment to finding ways to transition to a net-zero economy by the year 2050 (BUSA, 2021).

Because of the protection of workers in the coal sector, **trade unions** have been involved in activities that have delayed the adoption of renewable energy projects thus resulting in them falling under the core regime actor category. In 2015, Bheki Ntshalinsthali of COSATU said South Africa could not afford to let coal as a mineral resource go to waste (*Saturday Argus*, 12 September 2015). AMCU President echoed a similar statement in 2017 when he said, "unless jobs were offered to union members in clean industries, we would never voluntarily agree to the shutting down of mining and energy industries as it would be like committing suicide" (*Cape Argus*, 02 November 2017). Two years later, in partnership with Transform SA, NUMSA filed an interdict to prevent Eskom from signing power purchase power agreements for renewable energy projects arguing that the deals would lead to job losses (*Sunday Times*, 01 July 2018).

Table 4: Non-core actors

Actor Category:	Actor/Member:
Non-core actors	<ul style="list-style-type: none"> • State (Department of Environmental Affairs, National Planning Commission) • South African National Energy Development Institute (SANEDI) • Western Cape Provincial Government • Municipalities (City of Cape Town, eThekweni Metropolitan Municipality)

According to Smith, Stirling and Berkhout (2005), non-core regime members typically refer to those actors who are less intensively involved in the regime but present a high degree of inertia. At most, non-core actors represent those who have been guided by the regime but do not necessarily contribute to it (Van der Merwe, 2017). For this category, most of the identified actors are affiliated with the government. In terms of the national government departments, the **Department of Environmental Affairs (DEA)** (now Department of Forestry, Fisheries, and the Environment [DFFE]) appears to be one of the key non-core regime actors. A likely reason for this may be due to the departments' role in developing low-carbon related policies in response to climate change. This can be seen in the role played by the Department in the development of South Africa's Green Economy (*The New Age*, 12 June 2012), a resource-efficient, low-emissions and pro-employment approach toward economic growth (*Star*, 15 September 2011). Apart from this, over the study period the previous Environmental Affairs Minister, Edna Molewa was quoted repeatedly emphasizing the government's commitment to "addressing the global threat of climate change" whilst also stressing the importance of South Africa reducing its reliance on fossil fuels by 2030 following sustainability and just transition principles (*Sunday Independent*, 26 July 2015). Tasneem Essop of the **National Planning Commission (NPC)** which is a government agency that was established in the year 2010 to drive the long-term and strategic plan for South Africa has also been vocal in terms of how the government should go about implementing the energy transition. A key emphasis by the commission has been the need for the "transition to a low carbon transition and resilient economy to be just thus avoiding the marginalisation of the poor" (*Cape Argus*, 20 October 2011, *Saturday Star*, 07 September 2019).

The third non-core actor that emerged in the analysis is the **South African National Development Institute** (SANEDI). Whilst its mandate is to direct, monitor, promote applied research for the Department of Energy and Mineral Resources (SANEDI, n.d.). Over the past ten years, SANEDI does not appear to have played a noticeable role in the reinforcement of the regime. In 2012 however, Willian de Beer highlighted that “the country’s infrastructure needed urgent rehabilitation and investment” (*Star*, 23 April 2012). De Beer’s main message to electricity producers and distributors was the need to invest in other forms of energy production such as smart grids (*Star*, 23 April 2012). In 2019, SANEDI encouraged the adoption of Renewable Energy technologies urging businesses to achieve this through sourcing funding from green finance institutions (*Cape Argus*, 24 April 2019).

The fourth identified non-core actor is the **Western Cape Provincial Government**. Provincial officials have been recorded emphasizing the important role of RE in the future of the province. In 2012, Premier of the Western Cape Hellen Zille said that by the year 2020, the province should be operating on a highly efficient and modern energy system with a limited carbon footprint (*Cape Argus*, 23 May 2012). To evade the impacts of load shedding, in 2020 more than 20 councils out of the 30 municipalities of the province were ready to purchase energy directly from IPP’s (*Cape Argus*, 28 February 2020). However, this could only have been possible with the approval of the national government. A year before that the current Premier Alan Winde urged the Minister of Energy and Mineral Resources, Gwede Mantashe to authorise municipalities to buy electricity directly from IPP’s (*Cape Argus*, 03 June 2019). Similar pleas were heard at the South African Local Government Association (SALGA) Energy Summit in March 2018 where various other municipal officials demanded that they be allowed to generate their own electricity and to purchase electricity from IPP’s (*Sunday Times*, 01 July 2018). The **City of Cape Town** also stated that it was “doing everything possible to move away from sole reliance on the state-owned power utility, Eskom” (*The Citizen*, 27 February 2019). The **eThekweni Municipality** has also been treading similar paths as it drafted its first energy policy and highlighted its plans to develop a Municipal Independent Power Producer Program wherein the City would purchase affordable energy directly from investors in the energy sector (*Sunday Tribune*, 05 September 2020). These are all proceedings that are testament to how the emergence of a range of challenges in the electricity system has compelled municipalities to re-define their role in the electricity value chain (Montmasson-Clair *et al.*, 2017). Whilst Smith, Stirling and Berkhout’s (2005) categorization of non-core actors sees them as contributing to inertia within the regime, the above analysis reveals the identified non-

core actors verbalising and engaging in action that is contrary to the regime i.e., in support of the adoption of renewable energy. The likely reason for this rests on agency, which highlights the varying levels of power within the regime. According to Smith, Stirling and Berkhout (2005), the exercise of power (which core actors have more of), gives them the ability to keep “certain issues or potential actions off the agenda” which in the context of this analysis speaks to the resistance towards regime transformation by core actors.

Table 5: Outside (external) actors

Actor category	Actor/Member:
External/Outside actors:	<ul style="list-style-type: none"> <li data-bbox="683 663 1380 1464">• Civil Society Groups: (WWF SA, Earthlife Africa, Greenpeace Africa, Groundwork, Oxfam SA, Centre for Environmental Rights, SA Climate Action Network, Alternative Information and Development Centre (AIDC), Project 90 by 2030, *Life After Coal, Southern African Faith Communities Environment Institute, 350.Org, WESSA, Just Share & Client Earth, Climate Energy & Specialist Interest Group (SIG), Extinction Rebellion, Climate Justice Coalition, South African National Energy Association (Sanea), SA Food Sovereignty Network (SAFSC) + Co-operative and Policy Alternative Centre (Copac), GenderCC Southern Africa, Greenconnection. <li data-bbox="683 1491 1337 1576">• Academia, Industry Experts (Mark Swilling, Anton Ebarhard – UCT, Harald Winkler – UCT, <li data-bbox="683 1603 1362 1688">• State (President, National Treasury (2011, 2016, 2019), DoE, CSIR) <li data-bbox="683 1715 1289 1749">• Labour (COSATU, SADSAWU, AMCU).

Outside actors, on the other hand, refer to those actors who openly criticize the regime by highlighting problems associated with it and by drawing attention to landscape pressures (Smith, Stirling and Berkhout, 2005). In essence, outside actors make all efforts to get core regime actors to respond. As revealed in the analysis, actors that consistently fell under this

category include the civil society groups, industry/academic experts, some government entities, and labour (trade unions). Throughout the 11 years, **environmental organisations** have repeatedly joined forces to protest against Eskom management for its “failure to provide clean and affordable electricity” (*Daily News*, 25 October 2012). Demonstrations against key government departments have mostly occurred after instances where the government has made decisions perceived to further cement the country’s reliance on coal (*Star*, 25 August 2010). One such instance is the lobbying that occurred in 2010 against the approval of the World Bank loan to fund the construction of new coal-fired power stations (*Mail & Guardian*, 18 March 2010). Similarly, during the year 2016, 13 civil society organisations lodged a complaint to the Public Protector’s office over the government’s failure to set GHG emission targets (*Saturday Star*, 27 August 2016). The other key role played by environmental organisations has been the provision of research studies highlighting the impacts of coal to people living in areas where coal-fired power stations are located (*Pretoria News Weekend*, 30 March 2019) and the general contribution of the burning of fossil fuels to climate change (*The New Age*, 01 April 2014). Over the years, environmental groups have also been frequently expressing their dissatisfaction with the speed at which the government has been responding to climate change and consequently with protecting vulnerable communities (*Cape Times*, 22 February 2019). Richard Worthington of the WWF-SA said, “the government claimed to have a strategy to tackle climate change, but all it had was a set of vague intentions, it is pretending to be doing something when actually it is simply maintaining the status quo” (*Witness*, 07 March 2019).

Industry experts such as **Mark Swilling** and **Chris Yelland** have also provided commentary on the detrimental impacts of the government’s support of coal. In the year 2010, Mark Swilling of the Stellenbosch University Sustainability Institute (SI) warned of the importance of South Africa’s mineral energy dominated economy keeping abreast of the global energy revolution (*Business Day*, 12 July 2010). Chris Yelland, on the other hand, warned of the health impacts of Eskom’s continuous dependence on the ageing coal-fired power plants and coal mines which he described as “dirty, thirsty, inefficient, unhealthy and non-compliant killers” (*Sunday Star*, 30 June 2018).

In terms of actors in the **Presidential office**, President Zuma’s role in the country’s energy transition was instrumental at the beginning of the enactment of low carbon phase policies. This is marked by his consent to host the 2011 United Nations Climate Change conference (*Mail & Guardian*, 09 December 2010) and setting voluntary reduction emissions targets at the 15th Conference of Parties in Copenhagen (Atteridge, 2011). President Ramaphosa’s role on

the other hand is more instrumental in work related to the restructuring of the country's utility, Eskom (*The Star*, 22 October 2019). A year into office, the President highlighted how the issue of Eskom's power outages was costing the economy thus contributing to investor unease. This is a statement that is often accompanied by him pointing out the steady reduction of fossil fuels and greater uptake of renewables in the country's energy mix as envisioned by the IRP (*The Citizen*, 22 October 2019). Because of its key role in the development of the first market instrument to curb carbon emissions in SA, the **National Treasury** is one of the national government entities that have been playing an outsider role. This is mainly seen through its instrumental role in developing environmental taxes such as the carbon tax. In 2011, the Chief Director of Economic Tax Analysis explained that "the rationale for a carbon tax regime included that it levelled the playing field between carbon-intensive sectors using fossil fuels such as coal and low carbon-emitting sectors using RE and Energy Efficiency technologies" (*Cape Argus*, 20 October 2011). The Treasury Department has also emerged as a key player in the approval process of financial bailouts to Eskom. In 2019, the department tightened the bailout conditions that needed to be met by the utility before accessing funds (*Pretoria News*, 10 October 2019). Whilst the **Department of Energy** also fell under the core regime actors, in 2018 Minister Radebe re-convened the signing of 27 RE projects that were delayed due to opposition by trade unions and former Eskom CEO, Brian Molefe (*The New Age*, 09 March 2018; *Sunday Independent*, 13 November 2016). The Minister was also recorded saying that "ignoring climate change would be to our own peril" (*Diamond Field Advertiser*, 14 November 2018). The other outsider government entity is South Africa's central science research institution, the **Council for Scientific & Industrial Research** (CSIR). In 2020, the Manager of the Energy Centre, Clinton Carter-Brown was quoted highlighting that the country's resources meant that it was well-placed to play a role in the energy transition (*Sunday Argus*, 08 March 2020).

The last identified actors within the outsider group are the **trade unions**. Whilst these also fell under the core regime actor group, in 2017 when the government shifted attention to nuclear energy – COSATU stated the importance of urgently bringing renewable energy into the energy mix (*Sunday Argus*, 27 August 2017). This was on the basis of needing to reconcile the environmental imperatives with the socio-economic needs of the poor through co-operatives. In 2018, AMCU gave its support for a move to a low carbon shift from coal-fired power plants which it described as being responsible for high levels of GHG emissions. AMCU's endorsement of the shift away from coal however came with a demand to the government for

a state-driven and socially owned renewable energy sector (*The New Age*, 26 March 2018). In this instance, both COSATU and AMCU emerged as proponents of energy democracy.

4.3.2 Frames contributing to regime stability

Described in this section are the various dominant frames in the form of storylines and narratives used by different actors which have been identified as supporting South Africa's current coal electricity-producing system (regime). The notion of using discourse to ascertain regime stability and/or instability has been sourced from Paredis (2013) who states that “in periods of stability, the logics of different actor groups follow similar trajectories, but in other periods – changes in trajectories can lead to mismatches and tensions between logics of actors, connections loosen up and instability sets in”. A similar idea is mentioned in Bosman *et al.*, (2014) who states that a repositioning in incumbents' discourses may indicate increasing pressures and pending regime destabilization. This highlights the important role and influence of discursive practices in transition processes (Leipprand, 2017).

4.3.2.1 “Pro-coal” frame

“Clean coal production and carbon capture storage (CCS) technology”:

Under the pro-coal frame, the first dominant theme that has been identified as part of the analysis is the narrative that supports the idea of producing electricity from clean coal production systems and with carbon capture storage technology. This narrative first appears in the year 2010 when it was used by the country's utility, Eskom to support its coal expansion program (*Star*, 08 March 2010). To date, the most prominent advocate behind the clean coal technology narrative is the Minister of Minerals and Energy, Gwede Mantashe. In 2019, the Minister said that “new investments will be directed towards more efficient coal technologies and the development of carbon capture and storage to enable us to continue using our coal resources in an environmentally responsible way” (*Sunday Tribune*, 20 October 2019). The Minister has also mentioned this on more than one occasion at the Presidential Commission Meetings where he emphasised the importance of more research being done on the use of clean coal technologies “so that we don't have a resource that is thrown down the drain because its dirty” (PCC meeting, 30 April 2021). To support this pro-coal frame, the Minister argues against competition amongst energy sources. Instead, he advocates for the use of multiple energy sources to support the transition. This is seen in his statement when he said that “we must shy away from a one-way approach towards a transition, oil and gas will be part of the country's energy mix” (PCC meeting, 30 April 2021). Nuclear is also another energy source

that the Minister has shown support of (PCC meeting, 30 July 2021). The other actor who mentioned the use of clean coal technologies at the Commission meetings is Eskom CEO Andre de Ruyter, but he also stated that due to its capital costs, it was unlikely that this technology would be deployed at a large scale (PCC meeting, 30 July 2021). In 2020, Chief Executive of the Council for Geosciences (CG), Mosa Mabuza echoed a statement similar to the Minister and de Ruyters, stating that “the country needed to explore clean coal technology so as to mitigate its impacts on climate”. Like the energy minister, Mabuza emphasized the need for coal to be part of the transition as it is a resource that the country is endowed with (*Star*, 05 February 2020). In contrast to these statements, Researcher David Hallows of GroundWork said that “the proposal of clean coal is merely there to justify coal-generated energy, there is no such thing as clean coal mining, and coal is a dirty business” (*The Citizen*, 18 December 2019).

“Renewable Energy (RE) is costly”:

The second narrative supporting the pro-coal frame appears to be the idea of renewable energy being too costly to produce. This is one of the narratives that was used by Eskom in 2017 to support its refusal to sign the RE purchase power agreements (*Citizen*, 10 October 2017). This sentiment was also echoed by the then Public Enterprises Minister Lynn Brown (*Star*, 31 July 2017). The other actor that categorically emphasized this narrative is the trade union National Union of Metalworkers (NUMSA) which stated that it was opposed to the REIPPP program because it cost more to produce than coal-fired power produced electricity (*Diamond Field Advertiser*, 14 March 2018, *The Citizen*, 16 November 2018).

4.3.3 Frames contributing to regime instability/destabilization

Described in this section are the various dominant frames and accompanying storylines and narratives used by different actors which support the need for South Africa to transition from the current coal electricity-producing system to a low-carbon and clean economy. Change or regime instability may take place through the emergence of new storylines that reorder understandings amongst actors (Scott, 2017). According to Paredis (2013), in transitions, it is during periods of instability that the regime may undergo profound change.

4.3.3.1 “Anti-coal” frame

“Declining cost of producing renewable energy”:

Contrary to the *renewable energy is costly* narrative, the analysis revealed a wider range of actors on the opposite end of the spectrum emphasizing the cost efficiency of producing

renewable energy. In the year 2010, after stating that the future will be entirely run-on renewable energy (RE), Richard Worthington of WWF-SA further said that “the only way we’re going to achieve a Just Transition to a sustainable electricity supply is to maximise the role of RE” (*Mail & Guardian*, 21 October 2010). Over the years, the support for renewable energy adoption due to its cost efficiency has been continually contrasted against investing in new coal projects. In 2013, Greenpeace Africa said that “state investment in a third coal-fired power station indicates regression in true development of the energy sector and compromises RE investments” (*The New Age*, 30 September 2013). Similarly, in 2018, the Centre for Environmental Rights (CER) said that “there is clear evidence that RE from solar and wind is cheaper than coal, can provide significant jobs, would allow for more sustainable access to electricity and does not have the same devastating impacts for the climate and environment” (*Saturday Star*, 01 December 2018).

Over time, the cost efficiency in the production of renewable energy has also been noted by actors from credible academic institutions. In 2016, Anton Eberhard of the University of Cape Town (UCT) flagged that whilst renewables were not suitable for base-load generation, they were becoming cheaper. Eberhard closed his statement by saying “we’ll have to maximise their contribution to the grid” (*The Witness*, 19 May 2016). This was supported by an analysis done by one of the country’s leading research councils, CSIR which found that new coal and nuclear were no longer competitive against the falling costs of renewables and associated technologies (*The Witness*, 17 November 2017). Recently, towards the beginning of the year 2021, Eskom CEO Andre de Ruyter echoed similar sentiments at the Presidential Climate Commission Meetings stating that a number of data points confirmed that renewable energy including storage was now the cheapest technology for electricity generation (PCC meeting, 30 April 2021). This narrative was also supported by the Head of Eskom’s Just Energy Transition (JET) office who said that “renewable energy makes a compelling economic case” (PCC meeting, 04 June 2021).

“Impact of coal on health and the environment”:

The second dominant narrative identified under the anti-coal frame is the impact that coal has on the health of people living near coal-fired power stations.

In the year 2013, Melitha Steele of Greenpeace Africa said that “it is critical to stop building new coal-fired power stations to safeguard South Africa’s water resources, avoid human health impacts and avert some of the worst impacts of climate change” (*The New Age*, 30 September

2013; 01 April 2014). To date, the group stresses the same point and sees it as “no exaggeration to state that South Africa has toxic and filthy air” (*Cape Argus*, 21 August 2021). Steele of GA further added, “Eskom’s coal addiction and refusal to comply with air quality standards is seriously damaging people’s health, there are casualties from Eskom’s chronic air pollution with disease and premature death being the tragic outcome” (*Cape Argus*, 21 August 2021). Throughout the 11-year study period, both Groundwork and the Centre of Environmental Rights (CER) along with other civil society groups have echoed similar statements. In 2019, the CER stated that the “right to an environment that is not harmful to health and wellbeing was compromised because of Eskom’s current electricity generation”. This statement was made at the back of the historical choices of Eskom to invest in a fleet of coal-fired power stations that have subsequently had a detrimental effect on the health of surrounding communities (*Pretoria News*, 30 September 2019). Head of Groundwork Bobby Peek who is also one of the Commissioners in the country’s Climate Commission acknowledged the issues being raised at one of the Commission meetings but also went on to say that “the thing that we are missing in this debate and previous ones is the issue of understanding the health impacts of the current system” (PCC meeting, 30 April 2021). This is a matter that Mr Peek also brought up in the meeting held on the 04th of June 2021 stating that “people’s health is at play”. The emphasis on the impact of the current energy regime on people’s health has been so pertinent amongst civil society groups that it resulted in the recently formed Climate, Energy and Health (CEH) Special Interest Group (SIG) under the Public Health Association of South Africa (PHASA) labelling it an “injustice and climate apartheid against poor and most vulnerable people of South Africa” (*Saturday Star*, 30 November 2019).

As revealed in the analysis, the impact on health and the environment by the current electricity-producing system narrative is mostly emphasized by the country’s environmental groups. A common thread identified in the analysis is also that environmental groups have been playing an intermediary role of calling the country’s utility out on its reliance on coal. From the perspective on the impact of the environment, large emissions that contribute to the climate change phenomenon have also been a key factor stated by environmental groups. In 2020, Groundwork said that “investing in new fossil fuel-based electricity resources will lock SA into higher GHG emissions for at least the next 30 years” (*The Citizen*, 05 August 2020). Thus, civil society has played the dual role of being the voice for the poor and the environment. Of importance to note is that the role of civil society groups in highlighting the issues associated with the current regime is consistent with their previously revealed position as outside actors

which have been identified as having the role of calling regime actors to adopting alternative methods in transitions.

“End of coal”

One of the other dominant storylines identified under the anti-coal frame is the narrative against further investment in coal as a primary resource to produce electricity. As revealed in the analysis, the need for the country to “break away from business as usual” appears in 2010 in a statement made by Richard Worthington of WWF SA (*Leadership SA*, 01 May 2010). In the same year, the group launched a campaign against the construction of a R142billion coal-fired power station with Richard emphasizing that “it was a no-brainer that the government should consider scrapping Kusile in its scenarios” (*Star*, 26 August 2010). Similar to the cost efficiency in the production of RE, the argument for the need to transition away from coal appears to be supported by the ability of renewables to take over the country’s electricity production needs. In the year 2013, Greenpeace Africa said that “investment in RE sources such as solar, wind and natural gases would be enough to sustain the country and would be the responsible option rather than reverting to building more coal-fired power stations” (*The New Age*, 30 September 2013). The other reason used for the support of RE electricity production appears to be the waning of coal markets. In 2014 and 2015 respectively, both Greenpeace and Tasneem Essop of the WWF warned the country against the declining demand for coal (*Daily News*, 14 March 2014; *Saturday Argus*, 12 September 2015). The CER has also been quite emphatic in this position stating that the “coal sector was uncompetitive” and that the “decision to stay invested in the resource would lock South Africa out of the global conversation” (*The Citizen*, 05 August 2020). The impact of coal on the economy of South Africa has been so unacceptable from the point of view of civil society groups that in 2019, Greenpeace called on the Minister of Energy to “abandon his previous defence of the dead-end coal industry and instead focus on finalising the IRP and maximising on the opportunities offered by renewable energy” (*Cape Argus*, 03 June 2019).

A complementary narrative to the need to abandon coal is the narrative around the coal infrastructure being old and dilapidated. The “shutting down of inefficient plants to diversify the energy mix” has not only been mentioned by civil society groups but by the current Eskom CEO (PCC Meetings, 30 April 2021). In support of this, the Head of the utility’s JET office emphasized the need to “overbuild renewables so that Eskom can be given a chance to shut down its coal-fired power stations” (PCC Meetings, 04 June 2021). The stance of current management to upscale on the building of RE sources stands in stark contrast to the stance of

the utility during the 2010-2017 period when it refused to sign PPA's for RE indicating a shift in the country's path to a low carbon economy.

“Green hydrogen and the need to create a new industrialised economy”:

The final identified storyline which has been identified as a contributor to the destabilisation of the current energy-producing system is the narrative around the need for the country to invest in energy sources that are critical for the low-carbon energy future of the country. At the first Presidential Climate Commission Meeting, Minister of Trade and Industrial Development Ibrahim Patel emphasized the need for the implementation of a suite of public sector interventions to support green industrialisation. The Minister further added the important role that would be played by both RE and green hydrogen in the 21st century noting both sources as “optimal for societies and for South Africa” (PCC Meetings, 30 April 2021). In the same session, Mxolisi Mgojo, CEO of the mining giant Exxaro made it clear that the mining industry was interested in “minerals for the future” which are those minerals that will be critical in “supporting clean future economies” (PCC Meetings, 30 April 2021). This is a process that Mgojo clearly stated would involve the industry looking at mining strategies beyond coal (PCC Meetings, 30 April 2021). The advancement of renewables and green hydrogen was also mentioned by Business Unity South Africa (BUSA) CEO, Cas Coovadia (PCC Meetings, 07 May 2021). Mark Cutifani, CEO of Anglo American also emphasized the criticality of these minerals which he said made “evident the importance of the creation of a new sector in the economy” (PCC Meetings, 30 July 2021). The relevance of this narrative is in its depiction of the embrace of technologies other than coal in the future of the country's electricity production system. The hydrogen economy and re-industrialisation of the economy through mining minerals of the future was also emphasized by Minister of Energy, Mantashe (PCC Meetings, 30 April 2021). In the context of South Africa, the reindustrialisation of the economy through alternative energy production methods is seen as a vehicle to creating employment and thus much emphasis is placed on the need for the technology used to generate electricity to be manufactured in South Africa to stimulate local job creation (PCC Meetings, 30 April 2021). According to Salma (2022), South Africa's hydrogen ambitions are driven largely driven by its decarbonisation goals. Because it's produced using renewable energy, green hydrogen is a cleaner fuel source and if executed correctly, presents the opportunity to revamp the country's industrial sector (Salma, 2022). The anticipated impact of hydrogen and minerals of the future on boosting the economy and exports as well creation of employment make these resources attractive to a range of actors representing different sectors.

4.3.4 Issues of “justice” in the socio-technical regime level

This sub-section will provide an overview of the findings on justice-related storylines within the coal electricity-producing system of South Africa.

4.3.4.1 “The energy transition must be just” frame

“Leave no-one behind”: inclusiveness

Under *the energy transition must be just* frame, two storylines have been identified. The first is the emphasis on not leaving anyone behind during the country’s low carbon transition. As revealed in the analysis, the idea of not leaving anyone behind is intricately linked to the need to ensure that the jobs of those relying on the coal value chain are secured in the process. In 2010, the National Union of Mineworkers (NUM) noted that the age of coal workers would require them to be reskilled for work in other energy sectors which would most likely prove difficult (*Business Day*, 12 July 2010). The mention of the reskilling of workers is an example of an action that could be taken to ensure that coal workers benefit from the transition to renewable energy adoption.

Since then, actors from various backgrounds have placed the same importance on the need for the transition to be just. In 2018, Jesse Burton of UCT’s Energy Research Centre emphasized that what mattered was for the government “to find a way to prevent the inevitable job losses” (*The Citizen*, 07 September 2018). The emphasis of the transition being inclusive in its ambit was also highlighted at the Presidential Commission Meetings when Tasneem Essop of the National Planning Commission (NPC) brought to the attention of Commissioner’s the need for bias of the commission to be “towards securing justice and fairness for those who are most vulnerable” (PCC Meetings, 30 April 2021). It is at this same meeting that the Secretary-General of the Congress of South African Trade Unions (COSATU) Bheki Ntshalintshali also pointed the commission to the fact that the “most important stakeholders are the workers”. He then went on to add that “a plan without securing jobs will not work” (PCC Meetings, 30 April 2021). On all occasions, the basis for the need to consider workers is premised on the fact that “they (workers) stand a chance to be more affected” by the transition (PCC Meetings, 30 April 2021). The Minister of Energy as well as the CEO of Eskom alike echoed similar sentiments. The Minister said, “there must be a just transition towards less carbon-emitting technologies, workers and communities in the affected areas must – as far as possible— not be left worse off” (*Sunday Tribune*, 20 October 2019). After emphasizing that the transition must be just, the CEO of the country’s utility stressed the duty that Eskom had towards ensuring that livelihoods are protected and improved through the transition (PCC Meetings, 30 April 2021). This frame’s

glaring advocacy for the need to put workers at the forefront of the country's energy transition by considering the impact on the vulnerable, impacted coal workers and the need to reskill them encapsulates all three tenets of energy justice: distributive, recognitional and procedural.

“The need to consider the country's national circumstances”:

The second storyline identified under *the transition must be just frame* is the need for the transition to be context-conscious by considering the national circumstances i.e., not to transition abruptly but gradually. In 2018, the then Minister of Energy and Mineral Resources Jeff Radebe said, “in its policy transition to the low carbon economy (LCE) – government response must be understood in the context of the country's national circumstances by addressing poverty and inequality in the country”. Doing this requires paying special attention to workers, jobs, and livelihoods. This idea was first mentioned by the National Planning Commission in 2011 when they acknowledged that “there is a developmental context in which our transition in South Africa needs to happen” (*Cape Argus*, 20 October 2011). This statement was supported by the realisation of the expected impacts of the transition to be unevenly felt, thus the need to avoid a situation where the poor become the losers of the transition (*Cape Argus*, 20 October 2011). Earlier last year (2021), the Minister of Environmental Affairs Barbara Creecy also added that the “transition to the LCE will only be just if it takes account of the existing high levels of inequality, unemployment and underdevelopment” in the country (*Cape Times*, 24 February 2020). Other actors that have echoed the same sentiments come from business. The general message from business is that because the transition needs to consider national circumstances, then it should be noted that “it cannot happen overnight” because it needs to be cognisant of the social and economic challenges faced by the country (*The Citizen*, 23 October 2019). According to the CEO of BUSA, the “social and economic implications of an unplanned shift will be too devastating to contemplate” (PCC Meetings, 07 May 2021).

4.3.5 Discussion

According to Smith *et al.*, (2005), the regime level can be understood as the source of structure for the agency of actors. This is because the regime level “accounts for the stability of the technical system” (Verbong, Mourik and Raven, 2006). As revealed by the analysis, in the context of South Africa, the country's coal-producing electricity system is the structure upon which several of the identified actors have been interacting. In the analysis, core/incumbent actors mainly consisted of members belonging to four actor groups i.e., Eskom, state departments, business, and labour. Non-core actors were mostly government entities whom though forming part of the regime, appear to have less power to effect change thus making

them subject to the resistance of the core/incumbent actors. The outside actor group category was dominated by civil society groups. Whilst the socio-technical regime analysis delineated regime actors across these three major actor categories, it is important to highlight that the exercise resulted in some actors falling across more than one category. This is an indication of two factors, the first highlights the existence of actors within the same group holding different views about the status quo. The second important factor revealed by the analysis is the changing position of actors over time. An example that illustrates both these points as revealed in the analysis is the identification of Eskom as a core actor when the likes of Mr Brian Molefe were leading the utility. This finding coincides with Van de Merve's (2017) statement which confirms that "regime members do not all look the same and their positions can never be regarded as permanent". What this also proves is that transitions are about fundamental changes in the roles of actors (Wittmayer *et al.*, 2017).

The second important point of discussion as revealed in the STR analysis is the existence of a diverse group of interdependent actors interacting with one another within the regime. The range of actors within the regime level also speaks to the varying existing interests in energy/electricity-producing systems (Matschoss and Heiskanen, 2018). In addition to this, according to Geels (2006), interactions amongst actors result in the formation of new networks and coalitions either in support or opposition of change. In the context of this study, coalitions were mostly identified within the civil society groups which have been identified as outside actors i.e., group of actors who openly criticize the regime by highlighting problems associated with it. The identified coalition is the Life After Coal Campaign which was developed in mid-2016 as a joint initiative by Earthlife Africa (Johannesburg), Groundwork and the Centre of Environmental Rights (CER). In essence, the campaign is "dedicated to discouraging investment in new coal-fired power stations and mines; accelerating the retirement of South Africa's coal infrastructure; and enabling a just transition to renewable energy systems for people" (LAC campaign, n.d.). The opposition's role to the status quo by civil society groups, as revealed in the analysis is a finding that supports Van de Poel's (2000) categorisation of social pressure groups as outside actors that have the potential to mobilise insiders in the regime.

The above point of discussion also highlights the third aspect that has emerged from the analysis, which is the existing competing frames and embedded storylines across the different actor groups. At a broader level, the three dominant frames identified include the *pro-coal*, *anti-coal*, and *energy transition must be just* frame. Each identified frame is supported by a

range of narratives. The identified existing range of narratives and storylines under each frame speaks to how regimes consist of strongly held opinions and interests regarding technological practices and the best ways in which these might be improved (Smith, Berkhout & Stirling, 2003). For instance, under the *pro-coal* frame is the stance by the Minister of Energy for the country to deploy clean coal technologies and storage options. Whilst the Minister has over time remained unswerving in his position, other actors have ridiculed this practice labelling it as an impossibility and as an agenda to remain using coal as the main electricity producing resource. The anti-coal frame, on the other hand, is largely centred on arguments that highlight the challenges associated with the continual use of coal. This includes points on the cost competitiveness of renewable energy sources and the impacts of coal on people's health and environment and contribution to climate change.

Whilst actors are either in support or opposition to coal under the pro and anti-coal frames, the storylines supporting the third frame (*need for the energy transition to be just: inclusiveness*) are supported by actors from a wider range of actors. This highlights the importance of the consideration of justice in the country's energy transition which is further indicative of the country's complex socio-economic context. *The need for the energy transition to be just* frame further highlights the consideration of distributive, procedural and recognitional justice to be vital factors in the country's energy transition. Narratives which speak to these forms of justice are for instance seen in civil society and the labour movements emphasis on the need to consider how the harms of the transition will be distributed through mentions of considerations for upskilling affected workers, the consideration of people's health by the current regime and constant reminders that the transition is fundamentally about people on the ground.

4.4 Socio-technical Niche Dynamics - Analysis and Discussion

This section aims to provide an analysis of the niche dynamics relevant to South Africa's energy transition. It will begin with a brief analysis of the identified actors followed by a discursive analysis detailing the activities adopted by actors in either strengthening or inhibiting the niche, which in this case refers to the adoption of renewable energy-related processes.

4.4.1 Actors in the Niche level

Table 6: Niche-level actors

Actor category:	Actor/Member:
Niche actors	<ul style="list-style-type: none"> • Independent Power Producers (IPP's) and RE industry associations (South African Renewables Initiative (SARI), South African Renewables Energy Council (SAREC), South African Wind Energy Association (SAWEA), South African Photovoltaic Industry Association (SAPVIA), • Development Finance Institutions (Industrial Development Corporation, Development Bank of Southern Africa) • Academia (Cape Peninsula University of Technology (CPUT), University of Cape Town (UCT), Stellenbosch University (SU).

According to Geels' MLP theory and Fischer and Newig (2016), actors in the niche level are those generally involved in experiments for systemic change and radical innovations. In essence, niche actors are involved in activities that differ from regime activity. In this analysis, identified niche actors ranged from independent power producers (IPP's), RE industry associations, development finance institutions and academic institutions.

The first group of the identified niche actors include the Independent Power Producers (IPPs) and Renewable Energy Industry Associations. At the back of projected increases in the country's electricity demand, IPP's stated that they could supply the majority of the required megawatts through greenfield projects or co-generation at their plants (*Daily News*, 21 January 2010). This, however, has been largely dependent on the availability of power purchase deals by Eskom. Renewable Energy Industry Associations have also been crucial in protecting niche activities. In 2011, the South African Renewables Initiative (SARI) explored different ways on how public funds from the international community could be used to help reduce the cost of capital faced by renewable energy projects (*Star*, 29 April 2011). Furthermore, in 2017 RE associations such as the **South African Renewable Energy Council (SAREC)** and IPP's were key agents in discussions geared towards stopping the delays in the signing of purchase power

agreements (*Pretoria News*, 04 April 2017; *Star*, 05 June 2017). Brenda Martin of the SAREC said “the refusal to sign the agreements is holding up approximately R58bn in investments, the delay could result in the industry dying out with major investors pulling out (*Pretoria News*, 04 April 2017). Though RE power producers appear to be ready for closing the energy gap, Wido Schnabel of the **South African Photovoltaic Industry Association** (SAPVIA) noted that the industry is held back by policy decisions and inertia that needs to be overcome (*Saturday Star*, 12 September 2020).

Development finance institutions have also emerged as essential niche actors. Since the beginning of the study period, both the IDC and DBSA have been involved in financing activities for renewable energy projects. In 2011, the **Industrial Development Corporation (IDC)** launched a Green Efficiency fund to the value of R500m. This fund was developed to promote investments in energy efficiency and renewable energy generation projects by private sector companies within South Africa. Head of Green Industries Rentia Van Tonder said “the fund would reduce energy costs, improve profitability and invest in technologies that facilitate the transition towards a low carbon economy” (*Sowetan*, 21 October 2011). The following year the organisation made R25bn available for investment in green-economy projects for a period of five years. These activities are in addition to the IDC’s role in the submission of bids for the Renewable Energy Independent Power Producer Program (REIPPP) (*Mail & Guardian*, 22 March 2012). Similarly, in the year 2012; the **Development Bank of Southern Africa (DBSA)** approved loans worth R9.6bn for renewable energy projects in support of the establishment of the Renewable Energy Sector in the country (*Star*, 01 November 2012). In line with the climate-fuelled divestment away from fossil fuels, investors have been abandoning coal-related projects. In the year 2020, commenting on Eskom’s Thabametsi coal-fired power station; both the IDC and DBSA were reported stating that they would no longer support the project (*Citizen*, 10 November 2020).

The final group of identified niche actors in this study were academic representatives from various institutions such as CPUT, UCT, and SU. The **Cape Peninsula University of Technology (CPUT)** established the South African Renewable Energy Technology Centre – the first centre to offer vocational training for RE related trades including wind and solar (*Star*, 23 September 2015). The **University of Cape Town (UCT)** on the other hand has actively supported the carbon tax discourse (*Pretoria News*, 03 June 2019) and in innovative research supporting RE adoption (*Diamond Field Advertiser*, 15 January 2021). The institution has also been assisting the Department of Forestry, Fisheries and Environment (DFFE) in modelling

pathways for the country's updated NDC target (PCC meetings). In the past year, **Stellenbosch University (SU)** launched a school for climate studies aimed at supporting the country's transition to a climate-resilient society and low carbon economy (*Cape Argus*, 26 April 2021).

4.4.2 Niche-level developments in South Africa's energy transition

Both transition studies and the MLP framework emphasize the niche as the level at which experimentation, innovation and/or entrepreneurial activities can spur transitions (Geels, 2004).

As alluded, the researcher chose renewable energy-related developments and activities as the niche development for analysis. The rationale in choosing renewable energy as a niche development to assess in the context of this study is because renewables serve as the country's key alternative energy source for achieving the transition. Thus, in keeping with the actor-centric analysis, the researcher used the media as a source to identify the different strategies that have been deployed by actors to either inhibit the niche system or strengthen the niche system. This categorization is based on the assumed ability of actors to either deploy strategies in either direction (Van Rijnsoever and Leenderstse, 2020). These actions/strategies were sought across each year of the chosen study period as illustrated in figure 3 below.

Figure 3: Identified renewable energy niche developments/activities as per the media

Year	Media		
KEY	Strategies strengthening niche system – strategies from the niche system to develop itself.	Strategies inhibiting niche system – strategies from the incumbent system to inhibit niche development	Key decisions
2010	State incentivizing industries industries designed to mitigate the effects of climate change (<i>Star</i> , 11 Jan)	State released first draft Integrated Resource Plan (<i>Star</i> , 12 October 2010)	
2011	State forged widespread support for a green economy accord (<i>Star</i> , 18 Nov)	DoE established/ launched the REIPPP program (to replace REFIT) (<i>M&G</i> , 01 Dec)	
2012	IDC approved funding for 17 of the 53 submissions for round 1 of the REIPPPP (<i>Star</i> , 21 Feb)	W. Cape Premier: “By 2014, at least 10% of electricity used in the W.Cape will be generated from RE sources” (<i>Cape Argus</i> , 23 May)	DBSA approved a R9.6bn worth for RE projects to support establishment of the RE sector in SA (<i>Star</i> , 01 Nov)
2013	IDC - research forecasting more than 460 000 jobs from green economy, “renewables likely to create more jobs than the current approach” (<i>City Press</i> , 15 Dec)		
2014	Industry Policy Action Plan (IPAP) (DTI) emphasized the need for South Africa to begin the path of adapting to a reduced carbon intensive economy – and noted that this would require a massive technological shift (<i>The New Age</i> , 09 April)		
2015	PV testing facility established at Nelson Mandela University + Centre offering vocational training in the fields of wind energy safety and installation (<i>Star</i> , 23 Sep)	CSIR study showed that when compared against coal, renewables delivered a net benefit of R1bn to the economy (<i>Indep. on Saturday</i> , 10 Oct)	USAID-funded program - R214m to help SA transition to a green economy (<i>Cape Argus</i> , 13 Nov)

2016	Eskom CEO – Brian Molefe made a comment on the “disappointing performance of renewable energy plants” (<i>Pretoria News</i> , 05 May)	SAPVIA – Described Molefe’s statements as ill-informed and misleading (<i>Pretoria News</i> , 05 May)	
2017	IPP’s meet new Energy Minister Mmamaloko Kubayi - to discuss delays in the conclusion of PPA’s (<i>Pretoria News</i> , April 2017)	City of Tshwane plans to install PV solar panels on the rooftops of its municipal buildings to reduce operating costs (<i>Pretoria News</i> , 20 July)	Eskom refuses to sign Purchase Power Agreements (<i>Sunday Argus</i> , August 2017)
2018	NUMSA and Transform RSA file a court application with the North Gauteng High Court lobbying against the signing of the outstanding RE PPA’s by Eskom (<i>Diamond Fields Advertiser</i> , 14 March)	Energy Minister signs off 27 delayed RE independent power producer programme contracts – the biggest procurement by the Department of Energy to date (<i>The New Age</i> , 05 April)	
2019	City of Cape Town appeal to Pretoria High Court – City wants itself and other municipalities across South Africa to purchase cleaner energy directly from Independent Power Producers (IPP’s) (<i>The Citizen</i> , 27 February).	Dept of Environmental Affairs appeals to panel of experts from the CSIR to reconvene the identification of renewable energy development zones with reference to a just transition from coal-based to green energy (<i>The Citizen</i> , 09 October).	In support of the country’s transition from fossil-fuel based to clean energy as envisaged in the IRP, President Ramaphosa announced the government’s plans to develop a framework to take ageing coal plants out of service (<i>The Star</i> , 22 October).
2020	President Ramaphosa announces governments readiness to embrace self- generation by households and businesses (<i>Mail & Guardian</i> , 17 January)	SAPVIA “players in the renewables industry stand ready to sprint ahead but are held back by policy decisions and inertia that must be overcome if we are to emerge from this crisis” (<i>Saturday Star</i> , 12 September)	
2021	President Ramaphosa told the World Economic Forum he was in the process of roping in private players in the industry and allowing local municipalities to generate their own electricity (<i>Cape Times</i> , 27 January)	Minister Mantashe announced 8 preferred bidders for the emergency supply of 2000MW of power as part of the RMPPPP (<i>Daily News</i> , 26 March)	Minister Mantashe opened a new bid window of the REIPPP - raising the licencing threshold for embedded generation from 1MW to 10MW (<i>Daily News</i> , 26 March)

Strategies strengthening the niche system:

Whilst this category is an analysis to identify how the niche system adopted strategies to develop itself, the analysis revealed that in South Africa, the renewable energy system has mostly been nurtured and guided by state actors. The year 2010 is viewed as the time when the state began incentivising industries designed to mitigate the effects of climate change (*Star*, 11 January 2011). A key niche strengthening strategy identified in this instance is the release of South Africa's draft Integrated Resource Plan. The 2010 draft IRP is understood to be one of the first recognizable actions to support the country's renewable energy regulatory framework (CAMCO, 2010). Another crucial step adopted by the State through the DoE is the establishment of the REIPPP primarily by the Department of Energy and Mineral Resources program which is a competitive bidder program designed to facilitate private sector investment into grid connected RE generation in South Africa (*Mail & Guardian*, 01 December). During 2012-2013, both the Industrial Development Corporation and Development Bank of South Africa acted as key players in the establishment of the country's RE sector through availing funds for the REIPPP program and research and development. The Western Cape government, through its persistent stance on the need to free itself and other municipalities from depending on the country's utility for electricity, is another strategy that has been strengthening the niche system (*The Citizen*, 27 February 2019). The other key and notable actor that appears to have been imperative towards the strengthening of the niche system is President Cyril Ramaphosa. More often than not, the President has continually appeared on local and international platforms wherein he made statements that revealed his support for the shift from fossil-based electricity production to clean energy alternatives. Under the Ramaphosa administration, the Department of Energy Minister opened a new bid window for the REIPPPP and increased the licencing threshold for embedded generation from 1MW to 10MW (*Daily News*, 26 March).

Strategies inhibiting the niche system:

Unlike the varying strategies identified towards strengthening the niche system, the analysis revealed three related occurrences that happened over consecutive years namely 2016, 2017 and 2018 aimed at inhibiting the development of the RE program. In 2016, Brian Molefe (Eskom CEO) expressed his disappointment over the underwhelming performance of renewables. This was followed by him refusing to sign the associated power purchase agreements (PPA's) in the year 2017. In like manner, in 2018, NUMSA and Transform SA filed an interdict against the signing of the remaining PPA by Eskom.

4.4.3 Discussion

Whilst the MLP assumes an almost linear pattern in terms of the development of niche activities and technologies. The above analysis reveals that niche developments are not always embedded in systems allowing them the chance to thrive. In practice, this process is hindered by the power of actors in the regime system who openly resist change (Hansen *et al.*, 2018). Thus, as opposed to a rapid development in niche technologies, the old and new systems tend to co-exist, manifesting itself in a competition between the regime and niche developments. In this instance, the constant refusal of Eskom to sign PPA's during the early stages of the RE program and during Brian Molefe's term as CEO around 2017 makes Eskom a key source of inertia. The power over signing PPA's by Eskom appears to have placed IPP's and RE associations at the mercy of the utility thus emphasizing the difficulty of niches to develop in energy systems with large infrastructure and sunk investments as this causes barriers to entry (Verbong and Geels, 2002).

Whilst the analysis revealed a notable level of resistance to RE adoption, the role of the state in supporting the narrative related to the green economy spear-headed by the incubator role played by both the DBSA and IDC in funding clean energy-related projects and the REIPPP program highlights the important role and action of actors to champion the development of alternative experiments, in this case renewable technologies. The role played by DBSA and IDC speaks to the importance of having protective spaces for new technologies to thrive.

Furthermore, the act of the provision of funding by international organisations – in this instance USAID funding granted in 2015 to help SA transition to a greener economy also highlights the differing contexts between developing and developed countries. Unlike developed nations, developing nations tend to depend on relatively small pockets of funding and unsustainable foreign aid which does not always create a conducive environment for the sustained growth of alternative technologies.

Since niche actors tend to constitute innovations emerging from a network of knowledge and research development initiatives (Fischer and Newig, 2016), it is not surprising that leading academic institutions including the scientific council in the country were identified in the study as important niche actors.

Whilst there were no notable justice considerations emerging from the niche analysis, it is important to note the social justice considerations catered for in the country's REIPPP program. These considerations are seen in the program's legal expectation of the each RE approved

project by IPP’s to contribute towards local community development within the 50km radius. This expectation is supposed to be achieved through socio-economic and enterprise development, local ownership, and job creation (CSIR, 2019). The country’s steep inequality levels necessitate that social considerations through the provision of economic opportunities for marginalised communities be an intricate part of the country’s RE adoption, which is again indicative of the dire socio-economic conditions of the country. Both distributive and recognitional justice in the context of RE projects are indirectly made a consideration in this regard.

4.5 National government policy position - Analysis and Discussion

Being subject to a future global economy that is carbon constrained places South Africa in a position where it has no choice but to alter its future energy planning scenarios. Since much emphasis has been placed on the country’s energy transition being just, this section of the analysis expands on the progress of the government in developing aligned policies. The analysis emanates from the keyword-in-context (KWIC) exercise conducted across three national documents namely, the 2019 Integrated Resource Plan (IRP), 2050 Low Emissions Development Strategy (LEDS) and the 2021 updated Nationally Determined Contribution (NDC).

4.5.1 Integrated Resource Plan (IRP) (2019)

Keyword	Number of References	Coverage
“Energy transition”	2	0.01%
“Energy transitions”	1	0.01%
“Just energy transition/s”	No results	No results
“Just transition”	9	0.05%
“Just transitions”	No results	No results
“Electricity transition”	No results	No results
“Electricity transitions”	No results	No results
“Socially Just Transition”	1	0.01%

The Integrated Resource Plan (IRP) is the country’s “electricity infrastructure development plan based on least-cost electricity supply and demand balance” (DoE, 2019). During its promulgation in the year 2010, the document was envisioned to be a “living plan”, i.e., subject to regular revision. Whilst the policy makes no reference to “just energy transition/s” and “electricity transition/s”, the document does however refer to “energy transition” to flag the importance of the recognition of countries having different energy transition paths. This is a point that seeks to make clear the varying local conditions that, inevitably determine the kind

of transition path that each country should follow. The emphasis of this point is more likely a result of the need for the country's transition to be "socially just and sensitive to political impacts on jobs and local economies" (DoE, 2019). In light of this, the "just transition" keyword appears nine times and it is similarly in the context of ensuring that the "path adopted to give effect to the energy mix" is conducted in a "socially just" manner. Other references of the just transition are made in acknowledgement of the 2015 ILO's non-binding guidelines of the just transition towards environmentally sustainable economies and societies for all. "Just transition" is also listed under decision 4 of the *key considerations and actions* section wherein are consolidated the key actions necessary for the achievement of coherent policy development in support of the just transition plan. Again, emphasis is made on the need to address job losses in the coal value chain (DoE, 2019).

4.5.2 Low Emissions Development Strategy (LEDS) 2050

South Africa's Low Emissions Development Strategy (LEDS) is a document developed in response to a component of Article 4 of the Paris Agreement which encourages Parties to strive towards formulating and communicating long-term low greenhouse gas emissions development strategies (DoE, 2020). According to the IEA, (2010), LEDS generally describe "forward-looking national economic development plans or strategies which encompass low-emissions and/or climate-resilient development economic growth".

Like the IRP, no reference is made to the "just energy transition/s", "energy transition/s" and "electricity transitions/s" keywords. The "just transition" however is mentioned 20 times. It first appears as part of the vision statement of the LEDS which states that "*South Africa follows a low-carbon growth trajectory whilst making a fair contribution to the global effort to limit the average temperature increase, while ensuring a just transition and building of the country's resilience to climate change*". Alongside the assurance of jobs for all, the just transition is also mentioned as one of the key strategy elements that will be necessary for promoting low carbon growth. Unlike the IRP, the LEDS goes further by categorizing the just transition across three stages i.e., "starting right", "turning the corner" and "massive roll-out" (DoE, 2020). The starting out phase describes the beginning stages of a just transition which would mainly include the development of long-term plans for each sector as a way to avoid being locked into emission heavy sectors. The second phase i.e., "turning the corner" involves the implementation of sector transformation plans. The final stage envisions a massive roll-out of all changes until they become a reality (DoE, 2020). The achievement of all three stages is hinged on well-coordinated policy action. Lastly, as echoed in the IRP, the just transition is

emphasised as a central element in the policy package that would inform the overall policy pathway required to implement a low-carbon transition.

Keyword	Number of References	Coverage
“Energy transition”	2 (in the bibliography)	0.01%
“Energy transitions”	No results	No results
“Just energy transition/s”	No results	No results
“Just transition”	21 (1 content page)	0.08%
“Just transitions”	No results	No results
“Electricity transition”	No results	No results
“Electricity transitions”	No results	No results
“Socially Just Transition”	No results	No results

4.5.3 Updated Nationally Determined Contribution (NDC) (2021)

Similar to the LED strategy, the most prominent keyword that appeared in the updated NDC is “Just transition”. In a similar vein to the previous documents, the NDC firmly acknowledges the just transition as core to shifting the country’s development path (DFFE, 2021). The just transition is also mentioned in the context of it being a pathway that can only be achieved if it is well-resourced (financed). This point is made in light of the embedded financial, technical, and capacity building support framework in the Paris Agreement which essentially affirms the role of developed countries in supporting developing nations (DFFE, 2021). In fact, under the mitigation section of the updated NDC, South Africa makes it clear that “targets have been set on the assumption that support will be provided to SA as a developing country” (DFFE, 2021). The third and final context which references the just transition is in the emphasis on how the process itself (in South Africa) means that no one should be left behind. In this instance, the process of ensuring a just transition is therefore seen as a measure necessary in achieving the reskilling, social protection, and work plan development for workers in the coal sector (DFFE, 2021).

Keyword	Number of References	Coverage
“Energy transition”	No results	No results
“Energy transitions”	No results	No results
“Just energy transition/s”	No results	No results
“Just transition”	16	0.14%
“Just transitions”	No results	No results
“Electricity transition”	No results	No results
“Electricity transitions”	No results	No results
“Socially Just Transition”	No results	No results

4.5.4 Discussion

In attempting to answer the final objective of this study i.e., understanding the policy position of national government regarding the country's just energy transition. The concentration of the word "just transition" across all three national policy documents highlights the centrality and importance of the country's energy transition being just – not leaving anyone behind. This is a trend that was also highlighted in the frame analysis under the socio-technical regime analysis and discussion section which identified "leave no one behind" as one of the core frames used by actors concerning the just transition. One may argue that the emphasis on the transition being just also speaks to the highly sensitive nature of the country's transition as it is primarily about protecting people's livelihoods (the imperative to not make anyone worse-off). In this context, it is unsurprising then that much emphasis is placed on the need for the country's energy transition to be cognisant of its local realities which is also a trend identified as one of the core justice-related frames.

In essence, because of the need to consider peoples livelihoods – South Africa's energy transition appears to be a balancing act for the national government. One sees this in how the country has an obligation to respond to climate change (as a landscape pressure) by decarbonizing its economy whilst meeting its social obligations, emphasizing the need for careful planning (NBI, 2021). More often than not, planning is supported by policy. In the case of South Africa's energy transition, whilst it is evident that the government has all intents of ensuring the transition is just (inclusive), South Africa is yet to enact country-specific implementable policies and plans to guide the process. It is for this reason that the President established the Presidential Climate Commission – a committee tasked with developing a just transition framework for the country. Thus far, however, Patel (2021) highlights existing policy tools which can be utilised by policymakers in the development of a just transition. These include:

- i. Promoting adjustments in technologies to minimise climate-induced impacts for vulnerable groups,
- ii. Focusing on the development of alternative and more diversified economic opportunities for local communities,
- iii. Developing labour policies aimed towards aiding communities in obtaining other forms of living,
- iv. Providing affected communities with sufficient time to secure alternative opportunities

Similarly, Essop (2017) highlights the need for a review of currently existing policies and regulations central to the country's energy system and social policies alike to ensure that the benefits of renewable energy are maximised whilst ensuring the protection of the most vulnerable.

Chapter 5: Summary findings and concluding remarks

Whilst the previous chapter focused on the key findings, analysis, and discussion as per the three levels of the MLP. This final chapter summarises the key findings of the study according to the objectives and analytical framework followed by the concluding remarks.

5.1 Summary Findings

5.1.1 Objective I: *Understanding the composition of central actors shaping South Africa's just energy transition*

Due to there being no agency at the **landscape** level (Fischer and Newig, 2016), the analysis at this level expounded on the macro-economic development processes and developments placing pressure on the country's coal-dominated electricity-producing system of the country. As such, the leading landscape pressure identified was the need to respond to the changing climate. Throughout the study period, this landscape pressure appeared as a major propellant behind the government heeding global calls to curb emissions. One could even argue that the first 2-5 years of the study period were key for government response as the period was characterized by government narratives that emphasized the role South Africa has towards contributing to the global reduction of greenhouse gas emissions. The then Minister of Environmental Affairs, Edna Molewa is amongst the key actors that used discourse that was in support of the need for change, often emphasizing the role of South Africa in curbing global climate emissions. Minister Molewa welcomed the 17th Conference of Parties of the UNFCCC which was hosted by South Africa as a key milestone and platform for the country to demonstrate its commitment towards responding to climate change (DFFE, 2011). Pressure from the international community (influenced by the country's signing of the Paris Agreement) and the declining demand for coal globally were other key development pressures identified. South Africa's key role in the international climate regime is likely due to its high emissions status in the continent and its vulnerability to the impacts of climate change. Lastly, because of the contestation between developing and developed nations regarding the extent of the role and responsibility of each group in responding to climate change – the study also found that there arose matters of distributional and procedural justice with the wealthier nations demanding the developing nations do more and the vice versa.

At the **regime** level, actors ranged across core, non-core, and outsiders. *Core/incumbent players* are those that over the course of the study period primarily were involved in activities that reinforce the status quo. These groups were identified using Smiths, Stirling and

Berkhout's concept of regime membership – analysing the degree to which different actors participate in carrying out functions reproducing the regime. The most notable core players were Eskom – the country's utility (responsible for the generation and transmission of electricity) and the business sector which included actors such as the EIUG and BUSA. Throughout the study period, Eskom was involved in activities that leaned more towards expanding its coal program over time, and on occasion refused to sign RE power purchase agreements. Thus, stalling and frustrating the RE progress. Business, on the other hand, was found to be composed of a number of players including those consuming close to 40% of the country's energy who at the beginning of the study period viewed the country's involvement in efforts to curb emissions as unnecessary. A case in point is the resistance to the carbon tax and watering down of South Africa's overall contribution to global GHG emissions. While these main groups (Eskom and business) had a clear position against renewable energy and climate change. Notable changes were seen in their stances towards the latter end of the study period. At Eskom, one may argue that this was spearheaded by a change in leadership, thus highlighting the importance of having champions for the climate within key institutions. Similarly, business only began to acknowledge its role in the transition and the need for the country to respond to climate action by committing to supporting the nation's commitments towards net-zero in the past year (2021). This finding is corroborated by Patel (2021) who stated that whilst the just transition narrative has always been mainstream in labour and justice organisations – “it is only in the last two years that the concept has expanded to the private sector”. This finding supports Wittmayer *et al.*, (2017) thinking which states that “transitions are about fundamental changes in the roles of actors”.

The other prominent group of regime actors are the outside/external actors – individuals who openly criticize the regime by bringing attention to flaws of the regime. At the core of this group is the need to be involved in activity that frustrates the core actor's position. The most vocal group within the outsider group was the civil society organisations such as Greenpeace SA, Earthlife Africa, WWF (SA), Groundwork, the Centre of Environmental Rights etc. These groups have been most active in highlighting the utility's defects and subsequent failure to protect the vulnerable accompanied by actions geared towards calling out the government's lack of commitment towards sufficient climate targets and action. Whilst civil society appears to play an intermediary role, there is little to no evidence of the group effecting much change, even through the formation of coalitions. This speaks to the lack of power which is often linked to the availability of resources (capital).

Actors in the **niche** level i.e., actors were typically identified by their involvement in experiments for systemic change. As such the study found the group to be mostly dominated by IPP's, renewable energy associations and academia. Within these actor groups, development finance institutions i.e., DBSA and the IDC were identified as having played a prominent role in the establishment of the country's RE flagship programme, the REIPPP. According to Naidoo (2021), through their investment decisions, financial intermediaries such as development finance institutions (DFI's) are powerful socio-economic and environmental change agents. This means that due care needs to be taken towards enhancing the capital structure of such institutions as they evidently will continue to have a role to play in financing the country's just energy transition path.

5.1.2 Objective II: Understanding the claims used by central actors to shape South Africa's just energy transition discourse

The first finding in the framing exercise is that of a delineation between actors who are pro-coal and actors who are anti-coal. The main narratives under the pro-coal theme were the notable support for clean-coal technology and the idea that the adoption of RE production would be too costly. Proponents of the pro-coal frame were mainly those with an interest in stabilising the regime as they are direct beneficiaries of it. An example of this is Eskom's insistence on the costly production of RE and their disappointing performance and Minister Mantashe's continual stated support for the use of coal as it is a resource that the country is richly endowed with.

Similarly, proponents of the anti-coal frame use narratives that lean towards the support of RE adoption thus contributing to regime instability. One such narrative is the declining cost of producing RE (a direct contrast to the pro-coal frame) and the impact that the current regime has on people and the environment. Unlike the pro-coal frame, the anti-coal frame mainly consists of actors from civil society groups i.e., outside regime actors. This finding supports Rennkamp's (2019) understanding of transitions tending to consist of actors that use discourse with competing objectives which is more often than not, evidence of their own interests. This is so because, in the varying narratives used by actors, one can see the technology preferences of each actor/actor group. Advocates for the pro-coal frame tend to highlight the need to use the resources readily available to South Africa's citizens in a manner that will not harm the environment which is almost always in reference to coal. On the other hand, supporters of the

anti-coal frame appear not to see the need for the continual use of coal – but rather highlight the benefits of widespread renewable energy adoption.

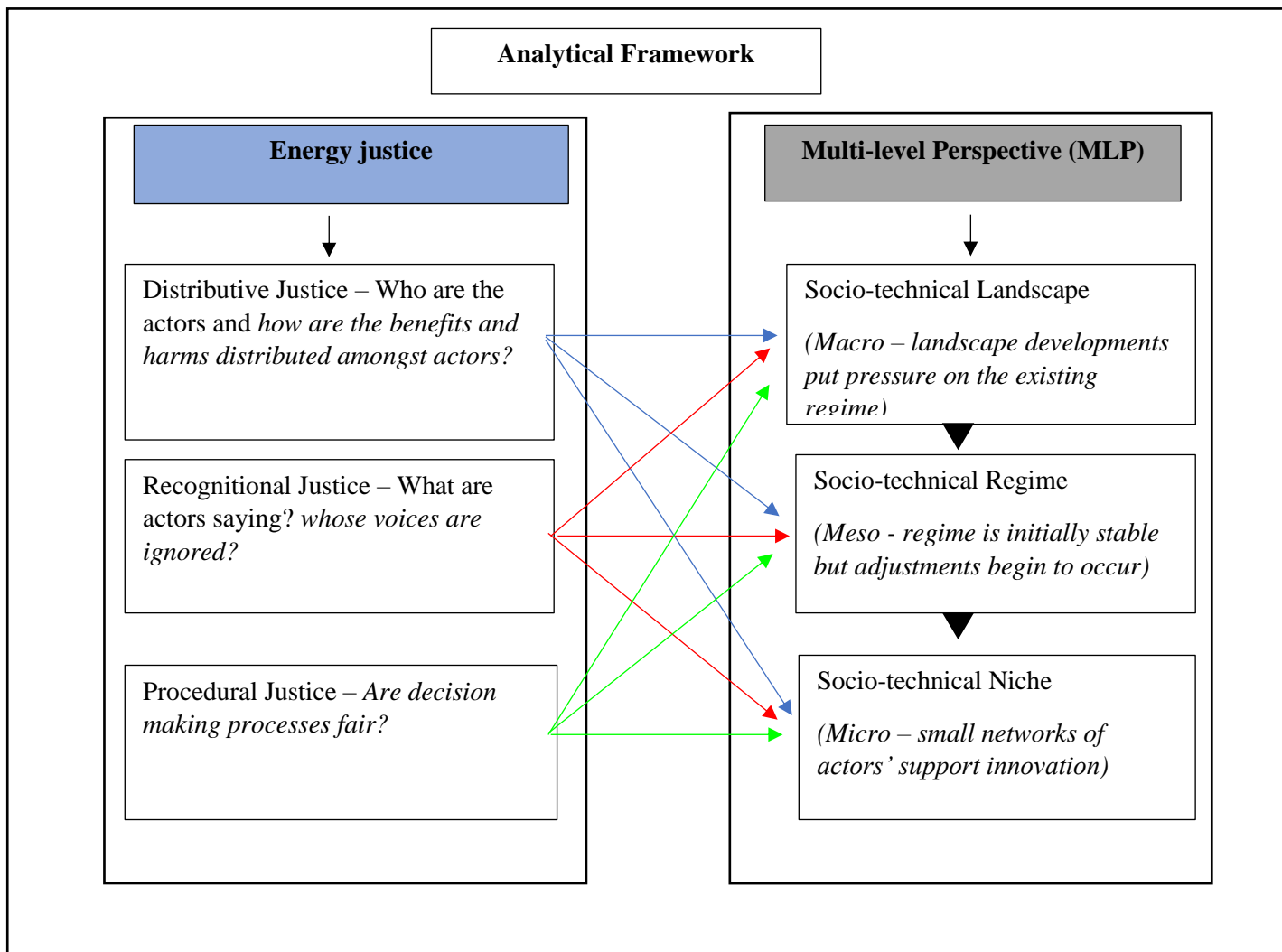
When it comes to the identification of issues of justice, the key identified frame was that of the country's energy transition to be just. This frame was found to be supported by two narratives namely, leaving no one behind and emphasis on the transition being cognisant of the country's national circumstances. Of notable importance in this finding is that the justice frame is primarily about the people and the protection of their jobs. From the analysis, it appears that most actors concede that the lack of consideration of people as the most important stakeholders in this discussion will mean that the just transition plan will not work. The importance of considering people (i.e., affected community workers) is emphasized in Patel (2021) who highlights the importance of just-transition related decision-making being of a bottom-up nature. This is especially important in the cases which involve stakeholders residing in regions wherein the direct impacts of the transition such as the closure of coal-fired power stations will be felt.

5.1.3 Objective III: To understand the policy position of the national government regarding the country's just energy transition

Apart from the emphasis on the country's energy transition being just, the keyword-in-context review exercise did not achieve much more than this. The need for the country's transition to be just is seen in how the country's NDC (national climate change action plan) is the only nation that makes inclusivity and the just transition an imperative in the transition towards a cleaner economy (Naidoo, 2021). This finding has also made it clear that there isn't necessarily a separate concept referred to as a "just energy transition" but that rather the phrase itself refers to the process of incorporating justice principles in the energy transition process. The primary reason for this is to ensure that the country's already high levels of poverty, inequality and unemployment are not further exacerbated (PWC, 2021).

5.1.4 Justice dimensions across the three levels of the MLP

This sub-section will elaborate on the findings of the varying dimensions of justice across the multiple levels of the country's energy transition.



Distributive justice:

As an overarching level with no agency, the landscape level of the country's transition was mainly influenced by the need to respond to climate change. As such the changing climate and country's commitment to contributing to the reduction of global GHG played the function of an exogenous pressure on the regime level. At the landscape level – developed nations have benefited their economies by emitting GHG over long time periods at the expense of developing nations who are now expected to contribute to the global reduction of GHG emissions which they are mostly victims of.

At the regime level, actors who have benefited from the status quo (“business as usual”) are incumbent players who have been direct beneficiaries of the regime (coal electricity-producing system). This actor category mainly includes Eskom, business (incl. large energy users, labour, and the state). The distribution of benefits towards these incumbent players is for example seen

in the special power purchase agreements between Eskom and energy intensive users. The distribution of harms/costs of the regime (negative health and environmental impacts) have been mostly borne by small communities living near coal mining regions. The costs of the current regime have also been borne by citizens who have been excluded from accessing the grid by virtue of the lack of affordability.

Recognitional justice:

Recognitional justice is about allowing all affected individuals the right to be heard, the right to fair representation and the freedom to participate in energy processes. In reality, however, this is not always the case. In the context of this study, the act of side-lining actors who do not have a voice by those deemed more powerful is strongly depicted in the struggle of IPPs to fully establish themselves in the face opposition from the core actor, Eskom which exercised its monopolistic power to stall RE adoption. Similarly, the entrenched intermediary role played by civil society namely environmental organisations essentially calling the utility out on behalf of affected communities is in a way a plea for those without a voice to be equally recognized. Although the country's transition pathway has been characterised by issues of non-inclusivity for all actors, the emergence of the just transition narrative as a framework for achieving the energy transition provides a structure for inclusivity which most actors are in support of.

Procedural justice:

Procedural justice is primarily concerned with fairness and inclusivity in the energy-decision making process. Since the country's transition has to a large extent been mainly dominated by the actors who have been actively engaged in activities reinforcing the dominant regime, fairness in energy decision is almost non-existent. This to a degree has largely been a result of Eskom's dominance across the generation, transmission, and distribution of electricity in the country. Over the course of the study period, the utility's monopolistic power has for instance afforded it the opportunity to increase electricity prices as and when it pleases without consideration of marginalised communities.

5.2 Concluding remarks

South Africa's just energy transition discourse is at a critical juncture. Climate change, as a landscape development pressure has and continues to place pressure on the country's coal-based electricity-producing regime. This is mostly seen in the country's response and commitment to curbing emissions and efforts to shift from fossil fuel-based electricity

production to renewable energy adoption. These efforts have not been without contention. Whilst outside actors, namely civil society (consisting mainly of environmental groups) use discourse that points out the defects and irregularities in the current electricity-producing regime, incumbent actors like Eskom, business and labour who have for years been beneficiaries of the regime use discourse that supports and stabilises the regime and participates in activities that oppose the narrative for change whilst at the same time revealing their own technology preferences. The two most dominant narratives shaping the country's energy transition discourse are either those in support of coal as a key resource for electricity production or a stance that emphasized the need for the country to rid itself of its coal addiction. The latter narrative is couched in the anti-coal frame which is dominated by actors who are advocates for the adoption of renewable energy production.

Whilst incumbent players have on occasion succeeded in their opposition and stalling of renewable energy adoption, progress in the adoption of RE overall has benefited from niche strengthening activities by actors in government namely, the Minister of Energy Resources (in the signing of the delayed RE PPA's) and through the incubatory support offered by DFIs such as DBSA and the IDC. The back-and-forth nature of interactions between the incumbent, outside and niche actors are therefore a testament to the non-linear nature of energy transitions.

Finally, all three considerations of justice (distributive, procedural and recognitional justice) appeared in one form or another across all three levels of the country's transition. At the landscape level, debates on how to distribute the climate responsibility between the developed and developing nations reveal the importance of distributive and procedural justice considerations to ensure fairness and that no one group is made worse off than the other. Though actors in the regime level belong to different categories, there appears to be a notable consensus regarding the need to consider the impact of the transition on local communities and workers. With that being said, it can be argued that the most vocal proponents for recognitional justice arguing on behalf of affected communities were civil society groups. There were no notable findings of justice considerations at the niche level, however, the obligation for private sector renewable energy projects under the REIPPP program to engage in local community development at project sites can be viewed as a form of distributive and recognitional justice.

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APPENDICES

Appendix I: Actor categorization – objective 1 (identified actor categories).

During the first code of analysis, identified actors were placed into different categories. These are tabulated below:

Actor categorization	Identified Actors
Utility	<ul style="list-style-type: none"> • Eskom
State/government	<ul style="list-style-type: none"> • National Energy Regulator of South Africa (NERSA) • Department of Energy (DoE) • Department of Mineral Resources & Energy • Department of Environmental Affairs (DEA) • National Planning Commission (NPC) • Industrial Development Corporation (IDC) • South African National Energy Development Institute (SANEDI) • Development Bank of Southern Africa (DBSA) • Western Cape Government • City of Cape Town • eThekweni Municipality • City of Tshwane • Department of Trade and Industry (DTI) • National Treasury of South Africa • Department of Public Enterprises (DPE) • President of South Africa • South Africa’s political parties • Council for Scientific & Industrial Research (CSIR) • Council for Geosciences
Users	<ul style="list-style-type: none"> • Energy Intensive Users Groups (EIUG) • City of Cape Town (CoCT) • Households’ (Residential homes owning solar PV systems, homes without electricity).
Academia (Researchers)/Consultants /Industry experts	<ul style="list-style-type: none"> • Energy Research Centre (University of Cape Town) (UCT) • Witwatersrand University (WU) • University of Western Cape (UWC) • Stellenbosch University (SU)

	<ul style="list-style-type: none"> • Sustainability Institute (Stellenbosch University) • FTI Consulting • Chris Yelland
Labour	<ul style="list-style-type: none"> • Congress of South African Trade Unions (COSATU) • SA Domestic Service and Allied Workers Union (SADSAWU) • National Union of Mineworkers (NUM) • Association of Mineworkers and Construction Union (AMCU) • National Union of Metalworkers of South Africa (NUMSA)
Civil Society: Non-Governmental Organisations (NGO's) Non-Profit Organisations (NPO's)	<ul style="list-style-type: none"> • Earthlife Africa • groundWork • WWF South Africa • WWF International • Greenpeace Africa • Oxfam South Africa • Centre for Environmental Rights (CER) • Alternative Information & Development Centre (AIDC) • Southern African Catholic Bishops • Project 90 by 2030 • Life After Coal (Impilo ngaphandle kwamalahle) • Southern African Faith Communities' Environment Institute (SAFCEI) • 350.Org Africa • Wildlife and Environment Society of South Africa (WESSA) • Action24 • Just Share • ClientEarth • Climate Justice Coalition (CJC) • South African Food Sovereignty Campaign (SAFSC) • National Business Initiative (NBi) • South African National Energy Association (SANEA)

	<ul style="list-style-type: none"> • African Climate Reality Project • GenderCC Southern Africa • Trade & Industrial Policy Strategies (TIPS) • Agora Energiwiende (German Think tank). • Greenpeace South-East Asia • Desmond Tutu • Ayakha Melithafa (young environmental activist)
Business sector	<ul style="list-style-type: none"> • Business Unity South Africa (BUSA) • General Electric Technology (GE) • Chamber of Mines (CoM) • Coal Transporters Forum (CTF) • Sasol • Novo Energy • Minerals Council South Africa • Anglo-American • Exxaro Resources
Renewable Energy Industry Associations	<ul style="list-style-type: none"> • Independent Power Producers (IPP's) • South African Renewables Initiative (SARI) • South African Wind Energy Association (SAWEA) • South African Photovoltaic Industry Association (SAPVIA) • South African Renewable Energy Council (SAREC)