The South African Just Energy Transition: The Role of Restorative Energy Justice

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Declaration

I, Victoria Ndeapo Wolf, hereby declare that this minor-dissertation is my original work and that it has not been previously submitted in whole or in part for a degree at any other institution. I have duly cited all consulted sources and my submission is accompanied by a Turnitin (plagiarism detection) report.

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Abstract

South Africa's recently published Just Transition Framework (2022) signalled a critical juncture for the country's heretofore separate energy decarbonisation and developmental agendas. However, despite the win-win framing of the South African just energy transition, evidence suggests that it may do little to mitigate socio-economic and environmental inequality, necessitating new approaches to energy scholarship and policy planning.

To date, the traditional principle of distributive justice (i.e. ensuring equitable access to energy) has been at the forefront of South Africa's approach to energy planning given the country's highly unequal socio-economic profile. Restorative energy justice, however, is increasingly being recognised across just energy transition research and practice as a means to both address and redress systemic inequalities within energy systems and importantly, to identify practical policy pathways – particularly in the varied and unique contexts of the Global South.

In this light, this study provides a critical review of the state of the South African just energy transition with a focus on the potential of restorative energy justice in particular to enhance socio-economic inclusion, as opposed to the retributive or corrective approaches of distributive and procedural justice (McCauley and Heffron, 2017:2).

By examining the South African just energy transition across market, social/environmental, and public/political dimensions, this study finds that while the just energy transition is distinctly an integrative framework, restorative energy justice is inadequately represented within the country's energy political economy. Ultimately, it is suggested that restorative policy instruments such as local content and ownership requirements, environmental impact assessments, environmental tax and energy financial reserve obligations serve as valuable conceptual bridges between scholarship and practice.

Key words: just energy transition, energy political economy, energy justice, renewable energy, restorative energy justice, inequality, inclusion

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List of Acronyms

ANC: African National Congress

COSATU: Congress of South African Trade Unions

GESI: Gender equity and social inclusion

IEP: Integrated Energy Plan

JET: Just Energy Transition

JET IP: Just Energy Transition Investment Plan

JETP: Just Energy Transition Partnership

JT: Just Transition

JTF: Just Transition Framework

MEC: Minerals-energy-complex

NUMSA: National Union of Metal Workers of South Africa

REI4P: Renewable Energy Independent Power Producer Procurement Programme (also referred to as the REIPPPP)

SAREM: South African Renewable Energy Masterplan

SSA: Sub-Saharan Africa

Chapter 1: Introduction

The phrase "just transition" first entered the lexicon of South African policy in 2011, with the publication of the National Climate Change Response White Paper (2011:5) which aspired "for an effective climate change response and the long term, just transition to a climate resilient and low carbon economy and society." It was only in August 2022, however, that South Africa published the landmark Just Transition Framework (JTF), signalling a critical juncture for South Africa's heretofore separate decarbonisation and developmental agendas.

Both in South Africa and globally, the narrower just energy transition (JET) is rapidly gaining traction as a means to decarbonise energy sectors toward a sustainable, 'net-zero' emissions system as economically and socially inclusively as possible (ILO, 2015; Patel, 2021). This includes the creation of decent work opportunities in novel, green industries and the elevation social justice concerns related to energy sustainability (ILO, 2022). The JET, therefore, provides both a description of a process of transformation from one energy system to another, as well as a set of tools and concepts to explain and enable such transitions (Baker et al. 2014: 794).

The opportunities of the JET for South Africa are manifold. The endowment of substantial natural resources (namely land, sunlight, wind and strategic metals) mean that the country is well poised to not only adopt innovative, renewable energy technologies but also to manufacture related products for export to international markets. In addition, given its energy justice underpinnings, the JET broadly aims to highlight and mitigate the moral and equity dimensions of energy production and use (Sovacool et al., 2017:677). As a result, the JET is framed as a 'win-win' scenario due to the potential for: 1) industrialisation and economic diversification; 2) the reduction of carbon emissions to the benefit of the natural environment and the mitigation of climate change; and 3) the narrowing of socio-economic inequalities.

1.1. Significance of the Study

The 'win-win' framing of the JET – particularly for South Africa – is the central focus of this paper as concurrent to this paradigmatic energy shift, entrenched poverty (including of energy), lagging infrastructural development and ecological degradation persist as key challenges facing the population (Seery, 2019). To date, the dominant focus of existing literature on renewable energy and of state energy planning in South Africa has been distributive justice i.e., securing equitable energy access for citizens given the country's highly unequal socio-economic profile.

There is, however, significantly less focus on *how* existing and emerging renewable energy technologies and practise in the region have the potential to further entrench socio-economic inequalities. Rising inequality – including of energy – means there is a critical need to consider how energy justice scholarship and JET practise can alleviate cross-scalar injustices within South Africa's energy political economy (Healy and Barry, 2017:451).

In this light, this paper makes a case for the contribution of restorative energy justice to South Africa's JET efforts. It argues that a narrow focus on distributive justice and procedural justice is no longer fit-for-purpose and that, going forward, South Africa's JET efforts must be restorative in nature.

The concept of restorative energy justice – which prioritises both redressing damage against communities and nature and restoring their wellbeing – is increasingly recognised across just energy transition scholarship and practice as an under-explored consideration for achieving desired social, ecological and economic outcomes through the decarbonisation of energy (Hazrati & Heffron, 2021:1; Just Transition Framework, 2022:9).

An oft cited challenge of the just energy transition is it's multi-faceted nature, reflected in the wide range of challenges discussed within this paper, namely: worsening energy insecurity in the form of loadshedding; a highly politicised bureaucracy with competing vested interests and

Eskom's strategic post-Apartheid role; a no longer 'fit-for-purpose' institutional environment marred by non-linear policy processes; renewable energy market mechanisms with limited capacity for socio-economic transformation/inclusion; the dire state of electricity transmission and distribution infrastructure and capacity constraints of municipalities and; an untenable unemployment crisis and the threat of further job losses due to decarbonisation.

A commonality across these challenges and dimensions is the potential exacerbation of inequality for the country's historically marginalised and most vulnerable communities through the JET. Ultimately, this study finds that restorative energy justice has the potential to not only curb inequality but also to realise the country's JET aspirations through practical policy measures.

1.2. Research Question and Objectives

The central question which this paper sets out to answer is: why should restorative justice be prioritised in the South African just energy transition (JET)?

Overarching objectives of this research are, therefore, to:

1. critically consider the market, social/environmental and public/political conditions necessary to foster a truly inclusive JET in South Africa;
2. explore and make a case for the contribution of restorative energy justice in improving environmental sustainability efforts, gender equity and social inclusion (GESI), the delivery of cross scalar energy justice and more broadly, inequality in South Africa's renewable energy political economy;
3. contribute methodologically and substantively to emerging JET scholarship pertaining to the relatively under-explored Sub-Saharan Africa (SSA) region and to deepen the scope of knowledge with regards to the political economy of renewable energy in South Africa.

Chapter 2: Literature Review

Literature on energy transitions is rapidly proliferating as global decarbonisation ambitions necessitate parallel discussions on implications and co-benefits[1] regarding social inclusivity, environmental sustainability, job creation, technological innovation, and economic growth. These concerns are captured by the JET, which aims to 'green' the economy in a way that is as economically inclusive as possible, creating decent work opportunities, and elevating concerns about social justice in the global transition to sustainability (ILO, 2015; Patel, 2021).

The concept of a just transition and the narrower JET was brought to the fore by labour unions in the 1980s in response to loss of jobs due to new anti-pollution regulations in the United States. Current JET scholarship, therefore, weaves together the discourses of energy, environmental and climate justice.

What differentiates JET discourse from those of energy, climate and environmental justice, however, is its emphasis on the labour-environment nexus in a transitioning (i.e., decarbonising) world (Healy and Barry, 2017:454). Over the last decade, the narrow conceptual focus on jobs by JET scholarship has been contested, with authors such as Reyes (2015:4) putting forth that JET refers to the broad need to create "local living economies" with a number of goals including: zero waste; the promotion of regional food systems; community-based renewable energy; public transportation; affordable and energy efficient housing; and ecosystem restoration.

[1] Co-benefits are positive externalities from the reduction of greenhouse gas emissions. These are typically other policy goals relating to job creation, improved public health and increased biodiversity and can inspire deeper and faster reductions in emissions (United Nations Economic Commission for Europe, 2016:1).

Given this broad scope of the JET, there are competing perspectives across the literature on the regarding the most effective pathway to achieve the JET. This literature review is therefore three-pronged, drawing on (1) market, (2) public and political (3) social and environmental debates across academic literature globally and across Sub-Saharan Africa.

The first section explores the role of the market in the renewable energy transition, by presenting debates on the relationship between energy systems and development (namely economic growth), financing mechanisms such as green bonds and auction schemes and the central role of Development Finance Institutions for fostering renewables investment in the SSA region.

The second section on public and political perspectives explores state capabilities needed to advance low-carbon energy reform toward a just transition, with a focus on the politics-bureaucracy interface and policy capacity of governments. The third and final section on social and environmental perspectives begins by exploring energy, climate and environmental justice scholarships, and concludes by presenting emerging JET discourse as a site for conceptual collaboration of antecedent energy, climate and environmental justice scholarships and the navigation of the blind spots in existing Western-led energy justice scholarship.

Ultimately, the inherent interdependence of these three dimensions (market, public and political and social and environmental) is a recurrent sentiment across the various fields of scholarship reviewed. There is also consensus across the scholarships regarding: (1) energy infrastructure's significant role as a determinant of socio-economic development; (2) the need for energy justice research oriented to the Global South; (3) that a broadened scope considering upstream energy justice and the politicisation of energy is critical; and (4) in exploring sustainable development pathways for SSA, interrogation of the Western development hegemony is needed to mitigate the reproduction of colonial patterns and widened inequality.

2.1. Market Perspectives & the Just Energy Transition

2.1.1. Energy and Economic Growth

According to the United Nations, between 2001 and 2010 six of the world's ten fastest-growing economies were in SSA. Despite this and decades of democratic rule, the region faces low levels of industrialisation, high commodity dependence, and high levels of social inequality – colonial continuities whereby Global South countries are 'locked' into being primary commodity exporters (Singh, 2021:328). There is substantial and growing awareness by regional governments of the potential to leverage the renewable energy transition to further sustainable or 'green' development namely by fueling (re)industrialisation, attracting foreign direct investment and alleviate developmental challenges of access and inequality.

For instance, lithium and platinum-rich Southern African countries (such as South Africa) could manufacture lithium-ion batteries to tap into growing local, regional, and global electric vehicle, solar and green hydrogen industry markets (Foli, 2020). This would allow transformation from highly commodity-dependent economies to industrialised, manufacturing-driven economies with a multitude of socio-economic co-benefits such as job creation, poverty alleviation and lowered carbon emissions (Foli, 2020).

The relationship between industrialisation – defined as a process of economic and social transformation during which there is disproportionate growth in the industrial sector – and economic growth is well evidenced across dominant academic literature (Moyo, 2020:106). Underpinned by the idea of development as economic growth, modernisation theory, for example, outlines a linear path for societies from 'pre-modern' towards 'modern,' capitalist and industrially developed (Steans & Pettiford, 2005:80). This industrial transformation should

theoretically lead to economic growth for any country which develops in line with this model (Steans and Pettiford, 2005:80).

However, Grabowski (2015:53) notes that while economic growth has occurred across SSA between 1960 and 2010, this has been without industrialisation and that a process of deindustrialisation (a decline in the manufacturing industry and a growth of agriculture since the 1970s) has occurred instead. Further literature suggests that the process of globalisation, in particular, has had a negative impact on industrialisation in Southern Africa, due in part to the maintenance of an economic model based on a high level of commodity dependence and the extractive nature of China's investment partnerships with African countries (Moyo, 2020:110).

On the other hand, fostering competitive global energy markets is recurrently cited as critical for improving operational efficiency, service delivery, innovation, electricity pricing for end-users and investment attractiveness (Zhang and Speed, 2020:2). Liberal markets are therefore regarded as the most conducive economic principle for energy reform (such as the decarbonisation of energy systems through renewables) as the removal of state bureaucracy and politics through private energy companies encourages a focus on cost, customer experience and profit (Zhang and Speed, 2020:3).

2.1.2. Market Mechanisms

Green bonds, renewable energy auction policies, further market liberalisation and carbon caps are all pertinent examples of market-led mechanisms increasingly being adopted to help countries globally (including in the SSA region) finance the energy transition. There is consensus across the literature that at present, public finance across the region is insufficient to meet the investment needs needed to scale renewable energy infrastructure in line with goals

in line with Sustainable Development Goals and the Paris Agreement.[2] There is also consensus that innovative green energy financing will be critical in shaping the region's capital-intensive energy future due to the current deficit.

It is estimated that only 4% of climate finance flows (USD 331 billion) reached SSA in 2013 (Marbuah, 2020:4). The volume of bilateral climate finance to the region, however, has seen a consistent rise from USD 7.7 billion in 2013 to USD 16.5 billion in 2017 (Marbuah, 2020:4). It is clear that closing the climate financing gap for low-income states (including in SSA) is a substantial undertaking. The African Development Bank has previously stated that the cost of climate change adaptation alone in Africa would be USD 20–30 billion per year over 10 to 20 years, excluding more than USD 70 billion needed to meet existing development and poverty alleviation needs" (Marbuah, 2020:4).

A study by Sweerts, Longa and Zwaan (2019:75) examined the financial conditions of renewable and fossil fuel-based electricity generation across 46 African countries and concludes that renewables (characterised by high upfront investment cost) are "disadvantaged by current financial practices" in the region. The authors make a direct link between the high investment costs of renewable energy deployment across the region, and the high risk (perceived and actual) due to political, financial, regulatory, and institutional insecurity. Specifically, the lack of specialised labour to service emerging renewable energy economies and limited physical infrastructure are cited as key risk-inducers.

It is also clear that international/regional Development Finance Institutions (DFIs) such as the African Development Bank (AfDB) and the Development Bank of Southern Africa will play a critical role in fostering renewables investment. Due to their ownership structures (i.e., the

[2] The imperative to finance renewable investment in the region is twofold: (1) for export, for example, of Green Hydrogen and related products to international markets and (2) to foster access to clean, affordable, and decentralised energy for populations.

representation of multiple national governments) DFIs typically have high creditworthiness, and as such are able to offer debt and equity at more favourable rates to borrowers than domestic lenders (Sweerts, Longa and Zwaan, 2019:78). In addition to relatively low lending rates for the capital-intensive renewable energy development, energy-focussed climate and green funds such as the AfDB's Sustainable Energy Fund for Africa and the European Investment Bank's Africa Renewable Energy Fund will be key in promoting investment and innovation within the sector.

In fact, by 2017, African states were the dominant beneficiaries of climate change mitigation projects totalling USD 1.1 billion of the United Nations Framework Convention on Climate Change's Green Climate Fund (Sweerts, Longa and Zwaan, 2019:78). At the national level, investment de-risking mechanisms include the implementation of supportive policies such as subsidies and feed-in-tarrifs as well as a range of financing instruments such as auctions/bidding schemes and green bonds.

Auction policy schemes pertaining to renewables is gaining popularity across SSA and has seen significant success in narrowing generation capacity gaps, scaling renewables through increased investment and restructuring ownership patters within the energy economy (Muller & Claar, 2021:334). A prime example is South Africa's Renewable Energy Independent Power Producer Procurement Programme (REI4P) introduced in 2011 (Muller & Claar, 2021:334). The market-based renewable energy mechanism allows private stakeholders to generate electricity (through renewable sources) to feed into the national grid, boosting the country's generation capacity. Notably, the competitive nature of REI4P has also resulted in lowered tariffs increasing the affordability of electricity for end-consumers (Eberhard et al., 2014:2). By 2013, DFIs constituted the second largest contributor of debt financing for the South

African REI4P at 31%, while commercial lenders constituted 64% and life lenders 5% (Eberhard et al., 2014:20).[3]

Green bonds – which function identically to traditional corporate or government bonds but finance climate adaptation and mitigate projects only – are increasingly being recognised as a critical financing mechanism to scale renewables across SSA. Marbuah (2020:10) notes that while to date the issuance of green bonds has been predominantly in Europe and the Asia-Pacific region, there has been increased appetite across SSA, namely Nigeria, South Africa, Seychelles, Kenya and Namibia. Despite this, a World Bank report notes that even though Africa has 23% of official climate finance, it has less than 1% of global green bond issuances and is paying more than twice compared similarly rated peers to access markets (World Bank, 2022).

By the end of 2019, USD 2.1 billion in green bonds had been issued in Africa (the five aforementioned SSA countries and Morocco), with USD 1.56 billion of this emanating from South Africa (Marbuah, 2020:9). Proceeds of the USD 2 billion in green bonds were targeted towards renewable energy project financing in all countries but Seychelles and Kenya, where the focus was infrastructure and marine resources.

Table 1: Green bonds issuance across Africa by October 2019

Country	No. of Green Bonds	Value (USDm)	First Issuance	Use of Proceeds

[3] See section on State Capabilities and the Renewable Energy Transition (page 23) in this paper for more on auction policy schemes.

Nigeria	4	136	2017	Energy, transport, water, land use
Namibia	1	5	2018	Energy, buildings, transport, water, waste, land use, adaptation/resilience
Kenya	1	41	2019	Buildings
South Africa	6	1,554	2012	Energy, buildings, transport, water, waste
Seychelles	1	15	2018	Land use, marine resources
Morocco	4	356	2016	Energy, buildings
Total	**17**	**2,107**		

Source: Marbuah (2020)

Once again, DFIs are central, as they have invested in green bonds across the continent, issued green bonds to finance climate focussed projects and have invested in capacity building of national regulators to develop green bond markets in the region (Marbuah, 2020:9).

Within the context of DFI's, Sweerts, Longa and Zwaan (2019:79) point to indicator-based lending as a de-risking mechanism where, for example, interest rates are determined by a country's income as per the United Nation's classification framework. This methodology has garnered criticism from development economists and academia alike, as it reduces development to an economic index. In line with the sentiments of Rodney (1972:3), an economy is not always an indicator of other social features. This classification, however, does

not take into consideration wealth inequality within the country in question, nor population size (Prydz *et al.* 2019). Countries such as Namibia – classified as upper-middle income owing to its gross national income (GNI) per capita of USD 9,650 – therefore hold lower investment risk, despite being notorious for extreme inequalities in wealth distribution and standards of living, across a population of only 2.5 million (Schmidt, 2009:2; World Bank, 2021).

DFIs are also typically regarded as critical for banking through crisis and transition, evidenced most recently by the COVID-19 response facilities by both the AfDB and the African Export-Import Bank's (Afreximbank) to African governments of USD 10 billion and USD 3 billion respectively (Hardy, 2021). Regarding renewables and climate adaptation and mitigation, a World Bank report (Tall et.al, 2021:10) notes that, in theory, while there is significant potential to employ market-oriented incentives and policy instruments to incentivise private sector investment, there is little practical experience in doing so. While Public-Private Partnerships (PPPs) are not new to the region, the energy transition is an emerging site for public-private collaboration and innovation.

There are contesting definitions PPPs across the relevant literature due to varying national and in the case of the United States even state-level interpretations and associated regulation. What is clear however, is that not every government-private interaction is a PPP as PPPs speak to formal collaboration on a matter of public interest.

> "*As such, we take PPP as an institutionalised form of policy interaction, respectively an arrangement between (one or more) organisations from the public sector and (one or more) organizations from the private sector. This means we make a distinction between the characteristics of PPP and those of other, more noncommittal interactions between government and private actors,"* (Heldeweg et.al, 2015:3).

As per Heldeweg et.al (2015:3), this collaboration between the public and private must fulfil three dimensions to qualify as a PPP. Firstly, the collaboration must aim to actualise public policy and must be politically legitimate through the representation of at least one public body. Secondly, this collaboration must be underpinned by a mutually supported, shared-value strategy to reap benefits to both the public and private stakeholders in question such as the successful implementation of public policy and profit generation respectively (Heldeweg et.al, 2015:3). Third and lastly, the collaboration must be a legal and institutional arrangement, with mutual obligations and liabilities (Heldeweg et.al, 2015:3).

In line with the discussed need to increase private sector investment in SSA's renewable energy economy, PPPs offer a range of benefits, namely (1) co-financing to minimise initial capital required by resource constrained governments, (2) improving operational efficiency (Dykes and Jones, 2016:384). PPPs thereby offer a viable alternative to raising capital through development aid mechanisms or municipal bonds to fund necessary projects (Dykes and Jones, 2016:384). However, Dykes and Jones (2016:385) identify a number of challenges facing PPP arrangements across the SSA region. These include: (1) lack of confidence of investors in the bankability of projects; lack of technological infrastructure and skill; (3) political challenges – namely corruption – which undermine the optimal implementation and delivery of shared value of PPP arrangements; (4) institutional environmental barriers such as poor coordination among government entities and; (5) no longer 'fit-for-purpose' judicial and regulatory frameworks which hinder PPP implementation and outcomes.

Authors such as Loxley (2013), however, point to potential shortcomings of PPP arrangements for the region. A typical feature of PPP arrangements (especially across SSA) is a lease structure for infrastructural assets, whereby public partners pay private partners an annual leasing fee. These leases are typically long-term in nature, ranging between 25 - 40 years,

allowing private stakeholders to earn substantial returns on investment (Loxley, 2013:487). Notably, Loxley (2013:490) offers a sobering reminder that while the public sector is able to avoid traditional debt servicing through PPPs, the long-term leasing arrangements often attached to partnership agreements are "simply debt in another form… and almost always more expensive than direct borrowing by governments." Additionally, the long-term nature of leases offers little flexibility for public partners and public infrastructure, not ideal within the renewable energy sector which faces rapid technological change. In countries such as Tanzania and Cameroon, PPPs relating to electricity generation projects have also been characterised as non-transparent and corrupt (Loxely, 2013:491).

2.2. Public & Political Perspectives & the Just Energy Transition

2.2.1. Bureaucratic Politicisation

Mayne et al. (2020) concede that specifying capabilities needed by governments to address complex social problems (also termed 'wicked problems') globally has remained intractable for Public Administration scholars. Broadly, state capabilities can be described as "critical resources that public-sector organisations depend upon when acting to address public problems," or simply a state's ability to implement public policy (Mayne et al., 2020:35). Authors such as Ukwandu (2019:49) and Sampath (2014) point to a lack of political legitimacy, the inability of SSA governments to mitigate market failure and develop context-specific policy responses, however, there is little structured treatment regarding these capabilities.

Furthermore, the attempts that have been made within the field have focussed on high-income economies of the West such as work by Goldstein (1990) and Sparrow (1980) on public policing in the United States and United Kingdom respectively. Bureaucratic quality – namely

professionalism and a strong politics-bureaucracy interface – is however commonly cited as a critical state capability for addressing problems.

Canonical authors on Public Administration such as Weber (1978), Wilson (1887), and Goodnow (2003) have argued in favour of the division between the political and the administrative/bureaucratic within the civil service since the early 20th century. While the topic has garnered much academic interest in the institutionalised and wealthy West, little exploration of the interface in developing countries has taken place. While the politics-bureaucracy interface generally refers to the roles of and relationship between politicians and administrators, sourcing a singular definition of the exact nature of interactions and factors affecting the relationship is challenging. According to Rouban (2003:310) the scope and complexity of politicisation differs in many countries and "explains why there is no general theory nor a major 'paradigm' of politicisation but instead a series of limited theories that try to handle some of the variables and analyse the case of a few different countries."

A paper by Maphunye (2005:220) explores highlights three useful dimensions for conceptualising politicisation in South Africa, namely: (1) politicisation as participation in political decision making; (2) partisan control over the bureaucracy for example, through political recruitment into the civil service and; (3) participation in political decision-making by senior public servants.

Separation between the political and administrative spheres is ideally linked to a politically neutral government administration as per the Weberian model of 'rational' bureaucracy and is associated with democratic governance. In this model, the administrative sphere acts as the implementing arm of the political demands of elected officials, while maintaining neutrality in implementation. Where there is a low level of separation, both sets of officials perform these various functions, which dilute responsibilities among politicians and bureaucrats. In these

cases, while bureaucrats must still ensure that policies are provided on an equal basis to all citizens, their political neutrality is not presupposed.

Traditional consensus across Public Administration literature, therefore, puts forth political neutrality and autonomy (the extent to which bureaucrats have the space or freedom to go about performing the functions they are assigned without political interference) as a central tenet for both efficient administration and democratic governance, necessary to a achieve a JET (Dasandi and Esteve, 2017:223). The politicisation of the civil service is often linked to low levels of performance, corruption and resistance to public sector reform. Attributing factors include a lack of accountability to citizenry due to "personal dependencies" and poor performance due to the lack of a merit-based hierarchy system (Duong, 2020:53).

Growing academic literature, however, suggests that the political-bureaucracy interface in developing countries such as Singapore, China and South Africa differ from those in the West given differences in institutional development and governance structures. The key implication of this is that 'best practise' approaches to the public-bureaucracy interface developed in the West may lack relevance for contexts in the developing world. More broadly, the strict dichotomy of the political and the administrative has been queried. Naidoo (2019:579) notes that South Africa's politicised bureaucracy has roots in post-colonial and patronage-driven state building across Africa and was solidified through the country's democratic transition. Similarly, Peters (2021:35) notes that "almost all public service delivery systems are dealing with some sort of politicisation" including in the West and in some instances, may be viewed as functional.

To substantiate the argument made by Peters (2021:35) that a politicised bureaucracy can facilitate reform, Maphunye (2005:221) contends that a politicised bureaucracy in South Africa

(given its 50-year Apartheid administration and turbulent democratic transition) was a means to implement the country's new political, social, and economic agenda.

On the role of state institutions and energy reform in particular, Zhang and Andrews-Speed (2020:2) argue that while the privatisation and liberalisation of energy is often regarded as the most ideal for fostering competition and efficiency within the emerging renewable energy economy, removing the political from the economic is often unrealistic. In this context, institutions are defined as formal and informal rules, values, norms and expectations of a society (Zhang and Andrews-Speed, 2020:3).

Using the case of China, Zhang and Andrews-Speed (2020) argue that inflexible and politicised state institutions are undermining the country's low-carbon transition, particularly by hindering the increased role of the market in the domestic energy sector. While China may be regarded as holding little relevance for the SSA region owing to its one-party state system, domestic energy sectors globally and in SSA typically have strong government involvement through State Owned Enterprises and one-party dominant systems are common across the region.

Loxley (2013:491) argues similarly in the context of PPPs across SSA, given growing evidence of corruption and opaque governance within energy sector partnerships:

> "It is not clear what PPPs might have to offer to address the problems identified if African governments are corrupt, face soft budget constraints or allow contract renegotiations."

2.2.2. Institutional Environment and Policy Capacity

Across academia, Institutionalism theory is increasingly being used as a lens for assessing the role of the state in the low-carbon energy transition. Institutionalism stipulates that the

institutional environment – described as mainly formal institutions consciously designed by societies – can undermine the low carbon energy policy reform (Zhang and Andrews-Speed, 2020:3). Importantly, the institutional environment within a state determines not only the policy reform agenda, but also the efficacy of reforms and actor agency and behaviour. The institutional environment (and politicisation thereof) must therefore be recognised as critical in assessing state capabilities to achieve a JET. This echoes arguments made by Energy Justice and JET scholars as discussed in consequent sections of this paper, who emphasise the common flaw of depoliticising (green) development and the ongoing energy transition in the region.

Policy capacity constitutes another frequently cited state capability across the literature. While there is debate on whether policy capacity should refer to state actors and institutions only or extend to non-state actors as well, the term generally refers to the ability of governments to make intelligent choices (Painter and Pierre 2005), to scan the environment and set strategic directions (Howlett and Lindquist 2004; Savoie 2003), to weigh and assess the implications of policy alternatives (Bakvis 2000), and to make appropriate use of knowledge in policy-making (Wu et al., 2018:2).

Broader conceptualisations of the policy capacity of government include the quality of resources available to fulfil the above criteria, while more narrow definitions focus on the ability to implement choices (Wu et al., 2018:3). Wu et al. (2018) developed a conceptual framework for policy capacity, whereby policy capacity can be understood by level (individual, organisational or systemic) and by competency (analytical, operational or political). At the system level, political policy capacity is understood as the ability to enable the participation of a range of stakeholders in policy processes, as well as transparency, accountability and public trust. Within a policy system with a high level of political capacity, for example, policy failures

are known to the public and accountability and recourse is taken by actors responsible (Wu et al., 2018:13).

As discussed under the section within this paper on market-led mechanisms within the renewable energy economy, auction policy instruments have proliferated on the content as a means to foster private sector involvement and boost (renewables) generation electricity capacity. In auctions, bidders compete for a portion of generation capacity in a specific location and if successful, are granted long term Power Purchase Agreements (PPA's) – typically 20 to 25 years in length – with an off-taker, typically a state utility such as Eskom in South Africa. Renewable energy auctions are desirable by governments as they shift administrative burden to independent power producers (successful bidders) and leverage competitive forces, leading to lower prices for end-users.

As Daszkiewicz (2020:212) notes, while Europe dominated the use of renewable generation auctions in 2010, Africa, Latin America, Asia-Pacific and Eurasia now boast higher numbers of auction PPA's. For SSA in particular, auctions and feed-in tariffs are expected to be the most common and successful supportive policies for the renewable energy transition. Feed-in-tariffs (set price tariffs for generated electricity paid to independent power producers as renumeration) are typically included in PPA's.

The inadequate focus on justice throughout the energy life cycle (i.e., both up and downstream) is a key criticism of energy (and climate) policy design by energy justice scholarship. In traditional and existing energy policy frameworks, social considerations are often narrowly economic, focusing on energy prices, jobs and, to some extent, energy access (Healy and Barry, 2017:452). Energy justice scholarship (as discussed in the next sub-chapter) has therefore grappled with the adequacy of policy frameworks, although it is evident that energy justice scholarship within non-Western contexts is underdeveloped.

However, there are some examples across the literature of policy analysis rooted in energy justice for the SSA region. For example, employing an energy justice perspective, a study by Muller et al. (2020) maps renewable energy policies in 34 African countries and their alignment with the United Nation's SDG 7 ("ensure access to affordable, reliable, sustainable and modern energy for all"). The study concludes that justice is present in several regional renewable energy policy frameworks, employing a range of market-oriented instruments and state interventions to shape the political economy of energy in line with sustainable development targets.

In particular, the countries of South Africa, Mauritius and Rwanda were regarded as having met the justice criteria in their respective renewable energy policy frameworks while also boasting generally comprehensive policy frameworks (Muller et al., 2021, 123). In contrast, Burkina Faso, Democratic Republic of Congo and Burundi were amongst those having non-comprehensive renewable policy frameworks which do not adequately consider energy justice (Muller et al., 2021, 123). The policy frameworks deemed comprehensive by the study acknowledge and strategically leverage the cross-cutting qualities of the (potential) energy transition for respective domestic contexts and by integrating, for example, gender-awareness into energy policies.

2.2.3. Colonial Continuities

As discussed, renewable energy technologies are increasingly recognised SSA governments as a means to pursue sustainable development, namely by: (1) growing economically, (3) reducing socio-economic inequality and (3) achieving emissions reduction goals (Salma and Tsafos, 2022). In the words of Parris and Kates (2003:559) the term 'sustainable development' has broad appeal and little specificity, with contesting ideas in academia and by development

practitioners regarding which dimensions of sustainability and of development ought to be emphasised.

However, four basic objectives are generally recognised across the literature regarding what comprises sustainable[4] development: (1) economic prosperity; (2) social inclusion and coherence; (3) environmental sustainability; and (4) good governance by major social actors, including governments and the private sector (Sachs, 2015). Sustainability within the context of sustainable development is, therefore, dominantly understood as relating distinctly to ecology and societies.

However, the concept of development – which has undergone a series of changes both in theoretical and practical terms – has long been recognised as a contentious site for debate regarding Global North-South relations of domination. For SSA, hegemonic understandings of development typically refer to the expansion of infrastructure, the building of resilient public institutions, the reduction of poverty, technological innovation, job creation and centrally, economic growth (Ahenkan and Osei-Kojo, 2014). However, authors such as Ferguson (1994) and Escobar (1992) put forth critiques of development as an 'invention' of Europe and a mechanism for the production and management of the Global South, with limited regard for local realities and needs, while underpinning concepts such as the 'idea of progress' leave little room for non-linear, non-European modalities.

Sustainable or 'green' development through the renewable energy transition in SSA is therefore susceptible to these colonial continuities. Sovacool et al. (2017:683) also put forth that the

[4] One of the first uses of the term sustainable in the contemporary sense was by the Club of Rome in its 1972 report 'Limits to Growth,' (a canonical text for Degrowth and Postgrowth scholarship) which urged the reduction in consumption and production within European societies and stressed the incompatibility of economic growth and ecological balance (Demaria *et al.*, 2013:192).

overreliance on indicator-based development such as the United Nation's Sustainable Development Goals (SDGs) depoliticise transformative change (such as energy transitions) and neglect local contexts in the Global South. Instead, the SDGs speak to the perceived needs of Global South countries by the Global North, and are shaped to suit standardised development packages, convenient for Western agencies (Sovacool et. al, 2017:683; Ferguson, 1994:176).

In line with the United Nation's Kyoto Protocol (1997) which commits industrialised countries to limit and reduce greenhouse gas emissions, Europe has turned to Northern and SSA to fulfil renewable energy mandates since the onset of the 21st century. With an initial focus on solar, wind and biofuels, green hydrogen has in recent years drifted to the forefront of Africa-Europe export-oriented renewable energy strategies. Emerging literature on green (neo)colonialism conceptualise of a modern-day green scramble for Africa whereby regions of Africa have become a means to meet Europe's decarbonised energy demands to further its own development.

Primarily focussed on renewable energy for export and not domestic markets, Hamouchene (2021) explains that the central concern is that "instead of helping the region with its green transition, these schemes will result in the plunder of local resources, dispossession of communities, environmental damage and entrenchment of corrupt elites."

To some extent, the imperative to supply Europe's green energy needs has eclipsed long-standing issues of lagging electrification rates, energy poverty for African households and regional energy insecurity (Showers, 2014:301). For Showers (2014:304), this extraction-centred North-South relationship emulates the colonial export of minerals and metals for electricity generation in Europe of the 19th and early 20th century. In contrast, electrification in SSA was slow, only reaching non-settler West and Central Africa in the first half of the 20th century and limited to colonial administrative units, the upper classes in urban areas and mines

(Showers, 2014:304). Employing the definition of renewability (the ability to be replaced), Showers (2014:304) notes the export of renewable energy from Africa to Europe as "abundant low-cost human energy" through the exploitation of African slaves as early as the 1450s.

This is reverberated by authors such as Brato et. al (2018), Barthel (2019) and Muller et. al (2021:121) who posit that the current energy transition (including scholarship relating to it) fails to grapple with postcolonial realities and instead mirrors North-South colonial power structures in epistemological (access to knowledge) and material terms (access to technology). The concern with unidirectional flow of capital and co-benefits surrounding minerals and metals extraction is not new; in his canonical 1972 book, *How Europe Underdeveloped Africa*, academic and political activist Walter Rodney writes that 'investments' by colonial powers in mining activities for commodities such as gold and diamond in South Africa and Angola quickly 'paid for themselves,' and were in turn producing capital for metropoles (the homelands of colonial powers) (Rodney, 1972:332).

Showers (2014:311) notes that if North-South historical patterns of exploitation and marginalisation are to be broken through the parallel and interdependent transitions of sustainable development and renewable energy, systemic changes relating to consumption and production in the Global North are necessary.

Here, Dependency theory's concept of the international division of labour may be valuable in explaining how emerging sustainable development transitions (such as that of renewable energy) inevitably benefit centre countries at the expense of periphery countries such as South Africa and the majority of the Global South, within the structure of global capitalism (Ganguly, 2010).

2.3. Social & Environmental Perspectives & the Just Energy Transition

2.3.1. Energy Justice and Social Inclusion

Across the literature, energy justice is widely regarded as the conceptual underpinning of the JET. Defined by Sovacool et. al (2017:677) energy justice refers to 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. Drawing on environmental justice and environmental racism scholarships (Bullard, 2005; Bullard, Johnson, & Wright, 1997) energy justice typically highlights social questions regarding three key dimensions of energy: (1) access, (2) affordability and (3) governance. At its core, energy justice is concerned with the question 'who wins, who loses, how and why?' in the context of energy supply and distribution (Healy and Barry, 2017:452).

Rooted in liberal justice theory (Sen, 2009; Rawls, 1991) energy justice conceptualises of three justice dimensions: distributive justice (allocation); recognitional justice (access); procedural justice (governance and political articulation/participation) as per Table 2.

Table 2: Traditional principles of energy justice

Traditional principles of energy justice	
Distributive energy justice	is concerned with the distribution of benefits from the energy sector and as well as the negatives
Procedural energy justice	is focussed on legal and due process with respect to energy activity

Recognitional energy justice	is concerned with the recognition of rights of different groups as an energy project or activity happens

Source: Hazrati and Heffron (2021:2)

It must be acknowledged that as liberal jurisprudence is rooted in Western philosophy, by extension, energy justice scholarship to date has largely ignored the non-West, despite stressing the importance of an anthropocentric approach to further justice in energy systems (Sovacool et al. 2017:678). Therefore, there exists a considerable gap within energy justice scholarship to consider social systems and justice in the varied and unique contexts of the Global South.

This shortcoming constitutes the first of the six necessary new frontiers of future energy justice research put forth by Sovacool et. al (2017:678): (1) new theoretical approaches from beyond classical Western theorists, (2) moral consideration of the non-human world, (3) embodied emissions and the spatial or scalar implications of justice, (4) business models and co-benefits for justice, trade-offs and tensions within and across justice principles, (6) utopianism and (6) discursive discontinuity.

The need for the recognition of cross scalar (consideration for both upstream and downstream impacts of energy-related activities) issues of justice within energy justice scholarship is also evident across the literature. This is owed to the interconnected nature of energy supply and demand patterns and more broadly, rising interconnectedness due to globalisation, defined as the establishment and intensification of interdependencies among different states and the emergence of a (rapidly growing) global social consciousness about common problems and shared responsibility (Gulmez, 2017:2). Geels (2011:25) substantiates the multi-dimensional nature of sustainability transitions, stating that they are non-linear processes and “necessarily

about interactions between technology, policy/power/politics, economics/business/markets, and culture/discourse/public opinion."

Therefore, authors such as Healy and Barry (2017:452) and Sovacool et al. (2017) emphasise the need for supply-side/upstream energy justice considerations relating, for example, to human health and labour impacts of fossil fuel extraction, and not only the traditionally dominant focus on greenhouse gas emissions (downstream). This broadened scope allows focus to be turned to a new set of actors, structures, and interdependencies crucial for grasping where the "true power" lies and how to stimulate systemic and cross-systemic change (Healy and Barry, 2017:452). This approach, therefore, politicises energy, producing the space to conceptualise of an energy political economy and distinguishes the renewable energy transition from a purely technological or even economic one.

Inadequate focus on power and justice throughout the energy life cycle (i.e., both up and downstream) is, therefore, a key criticism of energy and climate policy design globally by energy justice scholarship. In traditional and existing energy policy frameworks, social considerations are often narrowly economic, focusing on energy prices, jobs and, to some extent, energy access (Healy and Barry, 2017:452) without the recognition that injustice characterises the current energy political economy.

Indeed, emerging energy justice literature points to the significant risk to either sustain or exacerbate inequality through the JET, particularly in the Global South. Sovacool 2021:2-3) identifies four distinct types of inequality to be worsened. These include: enclosure which refers to the increased privatisation, notably within traditionally public-led sectors and the 'capturing' of resources, exclusion which relates to the lack of due process, recognition and inclusion of certain actors by power brokers, entrenchment which refers to the entrenchment of structural inequalities in society through low-carbon activities and lastly, encroachment

which refers to when activities aimed to mitigate carbon emissions (e.g. the construction of a renewable energy plant) conversely result in substantial damage to the natural environment.

Similarly, Sovacool et. al (2017:689) maps a number of incidences of energy injustice both past and emerging within the Global South and relating to the divestment in fossil fuels, ecological damage of extractivism and the scaling of renewables. In Gujarat, India, land acquisition processes for solar energy plants led to the loss of livelihoods and displacement of local communities due to the enclosure of previously common land. In South Africa, the high financial costs and lack of community consultation with regard to the state's Renewable Energy Independent Power Producer Procurement Programme (REI4P) disenfranchised local communities limiting the developmental impact of the programme pertaining to poverty and inequality i.e., through the establishment of community trusts and bursary schemes (Wlokas, 2015:2).

Naturally, gender also features as a prominent theme across the literature with respect to inequality and the renewable energy transition. Consensus is that increased research on improving the gender blindness of energy policies globally is of key importance, to ensure that the energy transition captures and addresses the needs of local contexts (Nel and Joel, 2019:3). The need for the substantive representation of women in energy decision-making is also called for, to ensure enhanced gender-aware policy outcomes to support the JET (Nel and Joel, 2019:3-5, IEA, 2018).

2.3.2. Energy Justice's Blindspot: What Can Restorative Energy Justice Contribute?

Given the explored shortcomings of traditional energy justice scholarship in both perceiving and articulating the social externalities of energy-activity, restorative energy justice (in addition to the traditional principles of distributive, procedural and recognitional justice) is gaining traction across both JET research and practise as a means to more adequately mitigate

inequality by grappling with overlooked forms of justice, more shrewdly exploring the social cost of the energy transition and importantly, to identify practical pathways – particularly in the varied and unique contexts of the Global South.

Restorative justice – which seeks to both redress and mitigate energy-related damage against communities and nature – McCauley and Heffron (2017:2) argue, is currently underexplored by energy justice scholarship, to the detriment of the JET. Importantly, restorative energy justice seeks to address systemic inequalities and injustices in the energy sector, as opposed to the retributive or corrective approaches of distributive and procedural justice.

Arguably, the origins of the JET are restorative in character, given the focus on the restoration of lost jobs and livelihoods in the 1980s United States due to anti-pollution regulations (McCauley and Heffron, 2018:1). JET literature today similarly emphasises the importance of skills training (particularly the re-skilling and upskilling of non-renewable energy sector workers), increasingly reflected in regional policy and planning documents such as South Africa's recently launched Hydrogen Society Roadmap (Department of Science and Innovation, 2022). Marking a notable point of distinction from energy justice scholarship, the JET aims to ensure that groups with limited resources – workers, their communities and small business, in particular – can take advantage of opportunities brought produced through oncoming change (Newell and Mulvaney, 2013:133).

This echoes critiques put forth by Wang and Lo (2021:4) that energy justice scholarship is typically focussed on identifying injustices with limited attempts to identify potential solutions. Given restorative justice's focus on restoring the dignity and wellbeing of victims of energy-related activity (notably through tangible policy instruments), emerging literature argue that restorative energy justice can serve as the missing link in conceptually bridging justice

scholarships and the JET practise, especially for highly unequal regions such SSA (McCauley and Heffron, 2017:2).

Adopting a restorative justice perspective will, of course, necessitate exploration of more than just jobs, but also of ecological degradation and, for example, the impact of extractivism on indigenous communities. A report by the United Nation's Intergovernmental Panel on Climate Change released in April 2022 explicitly names colonialism as a key driver of climate change, demonstrating growing awareness of the restorative dimensions, and not merely corrective or retributive dimensions as implied by distributive, procedural and recognitional (i.e. traditional) justice principles.

Swilling (2019:4) puts forth that given the current system of high inequality, an unjust transition is highly likely as sustainability transitions will continue to favour the interests of the (political and economic) elite. Energy infrastructure (currently in transition) has proved key in shaping social and political landscapes in antecedent industrial revolutions, evidenced by the role of coal in Western colonisation of the 19th century, social democracy in the West in the 20th century and the oil infrastructures which became the foundation of globalisation and neoliberalism in the second half of the 20th century and early 21st century (Swilling, 2019:244). Designing equity into sustainable energy policies and infrastructure is, therefore, critical in shaping the social landscape of the future across SSA. Emerging literature is therefore clear on the critical role of not only energy justice, but particularly restorative energy justice to achieve JETs.

Chapter 3: Research Design and Methodology

The central question which this paper sets out to answer is: why should restorative justice be prioritised in the South African just energy transition (JET)? In order to answer this, the paper employs a qualitative, single country case study method for the presented discussion, with South Africa as the selected country. Justification of the case study method and the selection of South Africa is provided in the following sub-chapter.[5]

Given that the research question focuses on identifying ways in which restorative justice can strengthen South Africa's JET efforts, a qualitative method was selected to allow for nuance and complexity as well as engagement with the relatively unstructured and emerging JET discourse (Bennett and Elman, 2007:171; Collier and Mahoney, 1996:71).

Thus, secondary data (collated via desktop research) pertaining to the JET, energy justice and the South African energy political economy was used to inform the qualitative discussion and analysis provided within this paper. This includes relatively recent academic work (2015 to date) which explores emerging concepts such as new frontiers for energy justice (Sovacool et. al, 2017). For the discussion chapters, the paper relied heavily on South African policy and planning documentation to demonstrate the state's JET agenda, priorities and capabilities. To a lesser extent, news media reporting was also used to evidence key events and public discourse pertaining to South Africa's energy political-economy. Of importance for analysis by the author of the studied material was the identification of priority issues relating to market, social/environmental and public/political domains and the engagement with policymakers in particular with the various forms of energy justice.

[5] See chapter 3.1 Case Study Justification, page 32.

As evidenced by the literature review, the conceptual underpinning of the JET is energy justice (traditionally conceptualised of as three tenets: distributive, procedural and recognitional justice). Given the research question (why should restorative justice be prioritised in the South African just energy transition?), the proposed hypothesis is that restorative justice can play a valuable role in mitigating the exacerbation of inequality in South Africa, through the renewable energy transition and in order to achieve a JET. The rational of this hypothesis (as explored in the consequent discussion sections of this paper) is that although the JET is a distinctly integrative framework, restorative energy justice in particular is insufficiently represented within South Africa's energy political economy and that it is critical given the country's highly unequal socio-economic profile and coal-dependency as set out in the case study justification sub-chapter.

Therefore, the dependent variable is defined as the achievement of a JET in South Africa and the independent variable as the presence of restorative energy justice across the South African energy political economy.

In addition, a working definition and conceptual framework for the South African was developed by the author to guide the exploration of the research question and to demonstrate the hypothesis. This is detailed in the Conceptual Framework sub-chapter.[6]

2.4. Case Study Justification

South Africa provides a strong basis (control and variation) to explore the paper's research question "why should restorative justice be prioritised in the South African just energy transition (JET)?" given that the country:

[6] See chapter 3.2 Conceptual Framework, page 35.

1. has an advanced national dialogue on just transition (including of energy) globally and across the SSA region;
2. has prioritised distributive justice (and less so restorative justice) in its energy planning to date;
3. is cited as the most unequal country in SSA and globally, exacerbated by a persistent unemployment crisis; and
4. is highly dependent on coal for both export and domestic power generation, with substantial and multi-scalar social, economic and political risks posed by decarbonisation.

Given the country context and the emerging nature of just (energy) transition scholarship, as per George and Bennett (2005:65-65) South Africa can be classified as either a heuristic case study, whereby it may "inductively identify new variables, hypotheses, causal mechanisms, and causal paths" or as a plausibility probe case study, to trial "relatively untested theories and hypotheses to determine whether more intensive and laborious testing is warranted."

The qualitative, single case study method allows for nuanced and empirically rich account of phenomena which may not be well suited to other measures or tests (Willis, 2014:4). Naturally, a limitation of the single case study method (particularly of idiographic *sui generis* cases) is that conclusions are not often generalisable (i.e., they cannot be extrapolated to other regions) due to variances such as political system, institutional environment, demography and economic indicators.

In addition, case study selection bias in common across qualitative research such as this paper which constitutes another potential limitation. Case study selection bias is commonly understood as "occurring when some form of selection process in either the design of the study or the real-world phenomena under investigation results in inferences that suffer from

systematic error," (Collier and Mahoney, 1996:59). This error is referred to as a difference between the estimated (in the study) and the true value of a variable or a misunderstanding of the relationship between dependent and independent variables.

As South Africa can be regarded as an outlier (i.e., not the most representative) case study within the SSA region due to its economic dependence on coal mining, its carbon intensity (highest in the region), its comparatively (within SSA) strong economy and well-developed JET policy frameworks and national dialogue, the risk of bias by the author is therefore present. However, as Collier and Mahoney (1996:58) concede, a number of studies which have not conformed to case study selection 'best practise' have nonetheless produced valuable and rich insight. Instead, "atypical or extreme cases often reveal more information because they activate more actors… and more basic mechanisms in the situation studied," granted conclusions are not generalised beyond the country (Flyvbjerg, 2006:229). Owing to the unique and comparatively advanced features discussed, the use of South Africa as a single country case study therefore offers an opportunity to optimally explore the research question.

2.5. Conceptual Framework

Given the review of the literature and specific context of South Africa (namely its highly unequal socio-economic profile and coal dependency), this paper asserts that in order to effectively realise a JET, efforts across the market, public, political and social and environmental dimensions must be restorative in nature to redress South Africa's highly unequal socio-economic profile.

For the context of this paper, restorative justice is understood as: addressing historical damages against individuals, communities, and the environment with a particular focus on rectifying or ameliorating the situations of harmed or disenfranchised communities (JTF, 2022:9).

Therefore, the proposed hypothesis is that restorative justice (above distributive justice) can play a valuable role in mitigating the exacerbation of inequality in South Africa, through the renewable energy transition and in order to achieve a JET.

Table 3 below demonstrates three principles of restorative energy justice in South Africa, extracted by this author from this conceptualisation of restorative justice.

Table 3: Principles of restorative energy justice for South Africa

Principles of Restorative Energy Justice	**Description**
1. Environmental sustainability	Maintenance, restoration and mitigation of further damage to the non-human world through the energy sector
2. Gender equity and social inclusion (GESI)	Redress and implications for historically marginalised citizens are at the forefront of energy decision-making
3. Cross scalar justice	Consideration for upstream, midstream and downstream impacts of energy-related activities

Source: Author

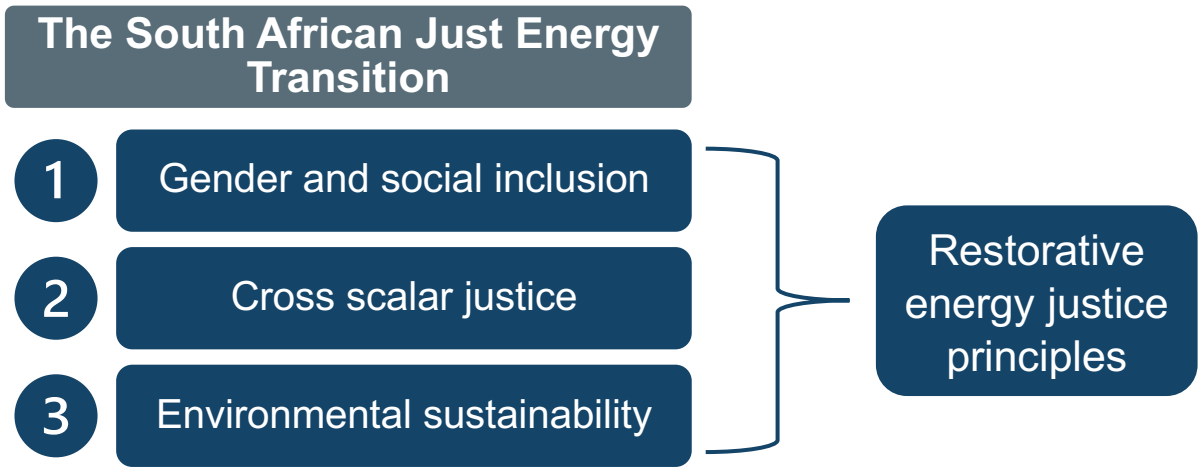
Based on this conceptualisation of restorative energy justice and its relationship with the JET (as set out in the hypothesis), a working definition and conceptual framework for the South African JET was developed by this author.

The development of a working definition of the South Africa JET is necessary to conceptually 'glocalise' the JET given the research question and specific country context for adequate analysis throughout the paper. Therefore, the JET for South Africa may be defined as: the transition from a fossil-fuel based energy system towards a low-carbon system, which fosters environmental sustainability, gender and social inclusion and cross-scalar justice with a

particular focus on redressing disenfranchised demographics. This working definition operationalises the three principles of restorative energy justice, as highlighted in Table 3.

Employing this working definition of the South African JET and the role of restorative energy justice (as set out in the hypothesis) a conceptual framework for the South African JET was developed to firstly, demonstrate the role of restorative energy justice and secondly, outline the relationship between the two variables in the specific context of South Africa. The conceptual framework, therefore, employs this restorative-centred working definition of the JET, as evidenced in Figure 1.

Figure 1: Conceptual framework for the South African just energy transition



Source: Author

In line with liberal justice theory, energy justice scholarship traditionally only identifies three tenets: distributive, procedural and recognitional justice (Hazrati and Heffron, 2021:2). Restorative justice, therefore, is considerably less explored within energy justice scholarship, and is only recently garnering interest for its ability to offer a valuable conceptual bridge

between energy justice discourse and just energy transition policy and practice, particularly for highly unequal regions such as South Africa.

Notably, South Africa's JTF (launched in August 2022) includes the traditional tenets of distributive and procedural justice, but neglects recognitional justice. Instead, the framework utilises restorative justice as the third tenet (in place of recognitional) demonstrating the increasing awareness of national policymakers of the potential, broad-spectrum value of restorative justice in enhancing socio-economic equity and inclusion.

As per Figure 1, the conceptual framework positions the South African JET as being distinctly restorative in nature, comprising of three dimensions: gender and social inclusion, cross scalar justice and environmental sustainability. This understanding of the South African JET and three dimensions are explored in the consequent discussion section, to demonstrate the integral role of restorative justice in realising a legitimately just transformation of the energy sector.

Chapter 4: Discussion

This chapter is dedicated to providing a debate on the strength of South Africa's JET efforts, with a specific focus on the potential contribution of restorative energy justice. Beginning with an overview of the country's energy sector, both its coal dependence and the highly politicised nature of its minerals-energy-complex is demonstrated. Thereafter, a critique of market mechanisms, infrastructural constraints, environmental and labour considerations and the adequacy of South Africa's JET-enabling policy frameworks to enhance social-economic inclusion through local and social ownership requirements is provided. This is followed by an exploration of South Africa's energy governance landscape, namely the challenges faced by

central institutions such as power utility Eskom, and importantly, the capacity for socio-economic inclusion through programmes such as the REI4P.

The end of the chapter demonstrates the meaningful role which restorative energy justice can play within the South African JET across these various dimensions, particularly for both mitigating and redressing the exacerbation of inequality due to the capability constraints discussed.

4.1. The Political Economy of Energy in South Africa

South Africa's energy sector has undergone substantial and ongoing transformation since the country's democratisation in 1994. As one of the most carbon intensive economies globally, South Africa is the seventh largest producer of coal, the fifth largest exporter and one of the largest producers of electricity from coal (Jain and Jain, 2017: 722). The concept of a minerals-energy-complex (MEC) was pioneered by Fine and Rustomjee (1996) in their landmark book, *The Political Economy of South Africa: From Minerals Energy Complex to Industrialisation* which highlights the South African economy's structural dependence on energy intensive growth (predominantly through mining and beneficiation) made possible by abundant and low-cost coal for similarly low-cost electricity generation. Uniquely, industry and energy have therefore developed symbiotically in South Africa, and this relationship is continually reflected in the country's JET discourse and policy.

Eskom – the country's national power utility and largest parastatal – has naturally played a central role in the MEC and the country's energy political economy. Since its inception in 1923 Eskom has maintained a vertically integrated[7] monopoly and at its peak supplied 95% of South

[7] Involved in generation, transmission and distribution.

Africa's electricity (Baker, Shen & Ayele, 2021). Today, Eskom supplies 90% of domestic electricity, owns the majority of generation infrastructure, is the sole owner of the country's high voltage transmission grid and shares distribution responsibility with municipalities (60% and 40% respectively) (McDonald, 2009:12; Eskom, 2020; Baker, Shen & Ayele, 2021).

The utility has been the subject of intense public scrutiny over the past two decades, owing to mismanagement spurred by concurrent financial, political and operational challenges. A consequence of this has been an electricity crisis characterised by scheduled electricity blackouts (load-shedding) as Eskom attempts to balance its generation capacity with consumer demand. Since 2007, there have been five periods of loadshedding in South Africa: (1) January 2008 – May 2008; (2) November 2014 – February 2015; (3) February 2019 – March 2019; (4) December 2019 – March 2020 and (5) March 2021 – present. In 2022 alone, the country has experienced almost 200 days of blackouts with the situation only worsening (Daily Maverick, 2022). In December 2022, Eskom introduced stage six[8] load-shedding (the highest implemented stage to date) as the parastatal's Chief Executive Officer, André de Ruyter resigned amid allegations of state sabotage.

In addition to Eskom's inability to meet current electricity demand, the utility is also unable to service its debt of more than R480 billion and has relied on government 'bailout' facilities in 2007, 2015 and 2019 – signals that it is on the verge of a "utility death spiral" (Eskom, 2020; Department of Public Enterprises, 2019:15). The result of Eskom's highly publicised poor governance and load-shedding has been a loss of investor confidence in the country, and a negative impact on industrial and business productivity, while the unbundling (separation) of Eskom's integrated generation and transmission operations is on the utility's agenda, captured

[8] There are eight Eskom load-shedding stages which relate to the number of megawatt's Eskom is able to shed from the national load as well as the frequency and duration of power outages. Stage one is the least burdensome while stage eight is the most severe and has to date (December 2022) never been implemented.

by the Department of Public Enterprises' *Roadmap for Eskom in a Reformed Electricity Supply Industry* document (Eskom, 2018).

The risk that energy insecurity poses for the achievement of the South African JET is substantial. In 2019, the energy-intensive mining and manufacturing sectors made up 20.6% of nominal GDP (Statistics SA, 2019). Combined, they accounted for 13.3% of formal employment (Statistics SA, 2019). In light of the country's concurrent unemployment crisis (35.3%unemployment rate) straining critical industries jeopardises jobs the country cannot afford to lose (Statistics SA, 2021). While Eskom's crisis holds clear implications for South Africa, the parastatal also plays a significant regional role as it sells electricity to seven Southern African countries (Bowman, 2020:396).

While there were mass electrification programmes led by Eskom towards the end of the 1980s, the end of the Apartheid regime in 1994 swung the utility into new territory. Until then, it had almost exclusively served industrial and white residential consumers, excluding the majority black population (Bowman, 2020:406). The expansion of electricity access thereby became a focal point of the African National Congress' (ANC) Reconstruction and Development Programme as well at the utility's role in a democratic South Africa, committing to doubling the number of grid connected households by the year 2000. This is reflected by consequent distributive-focussed policies such as the Free Basic Electricity programme (2003), the Energy Security Masterplan 2007 – 2025 (2007) and the Integrated Energy Plan (2016).

While there has been significant growth for rural populations within the first ten years of democracy, this has momentum slowed dramatically across all demographics since 2005. Table 4 demonstrates that Eskom only achieved 14.7% growth in electricity access between 1995 and 2000 as opposed to the envisioned 100% growth.

Table 4: Access to electricity in South Africa (%) between 1995 and 2020[9]

	1995	2000	2005	2010	2015	2020
Rural	23.8	54.6	72.8	75.9	80.2	75.3
Urban	85.3	85.7	86.2	87.1	88.1	88.8
Combined	57.6	72.3	80.8	82.9	85.3	84.4

Source: World Bank (2022)

In addition to increased provision to the majority population, demand for electricity domestically has increased over recent decades owing to increased industrialisation (particularly within primary industry such as mining and agriculture which consume approximately 60% of electricity supply), growing populations, urbanisation, and state policies targeting not only increased electrification but also the affordability of electricity (Fortuin, 2022:2).

Therefore, distributive justice (i.e. access and affordability) has featured prominently in South Africa's planning to date, given its Apartheid history and energy insecurity challenges since democratisation. Naturally, South Africa's energy political economy has also increasingly reflected environmental concerns and the global decarbonisation agenda. In 2009, former South African president Jacob Zuma committed to reducing the country's greenhouse gas emissions by 34% by 2020 and 44% by 2025 at the United Nations Climate Change Conference in Copenhagen (Presidency, 2009). This marked a distinct turning point in the country's commitment to sustainability through energy, despite critical electricity generation and supply challenges at home.

[9] Note: 1995 figures for electricity access in South Africa are unavailable on the World Bank's Global Electrification database. As such, 1996 figures have been used as substitute.

More recently, this carbon-consciousness is evidenced, for example, by the establishment of the Presidential Climate Commission (2020), Eskom's Just Transition Office (2020), the Low Emissions Development Strategy (2020), the Hydrogen Society Roadmap (2022), the JTF (2022), the draft South African Renewable Energy Masterplan (2022) and the ratification of the JET Partnership[10] announced at COP26 (and consequent investment plan).

Despite this, South Africa's decarbonisation and therefore JET has a long way to go. As per the Council for Scientific and Industrial Research's power generation statistics report for 2021 (2022:2), the primary energy source for power generation remains coal at 81.4%, while liquid fuel (namely diesel) and gas stands at 1.4%, renewables (including hydropower) at 11.9%, and nuclear energy at 5.4%. Table 5[11] below provides a comparison of the domestic energy mix between 2000 and 2021 at the utility scale.

Table 5: Energy mix (utility scale) in South Africa in 2001 and 2021

Source	2000 (%)	2021 (%)
Coal	74.8	81.4
Nuclear	3.2	5.4
Renewables (incl. hydro)	11.7	11.9
Liquid fuel and gas	10.3	1.4

Source: Statistics South Africa (2002); CSIR (2022)

As per Table 5, there is an increase of approximately 0.2% of renewables and a decrease of 6.6% of coal in the national energy mix over the past 21 years.

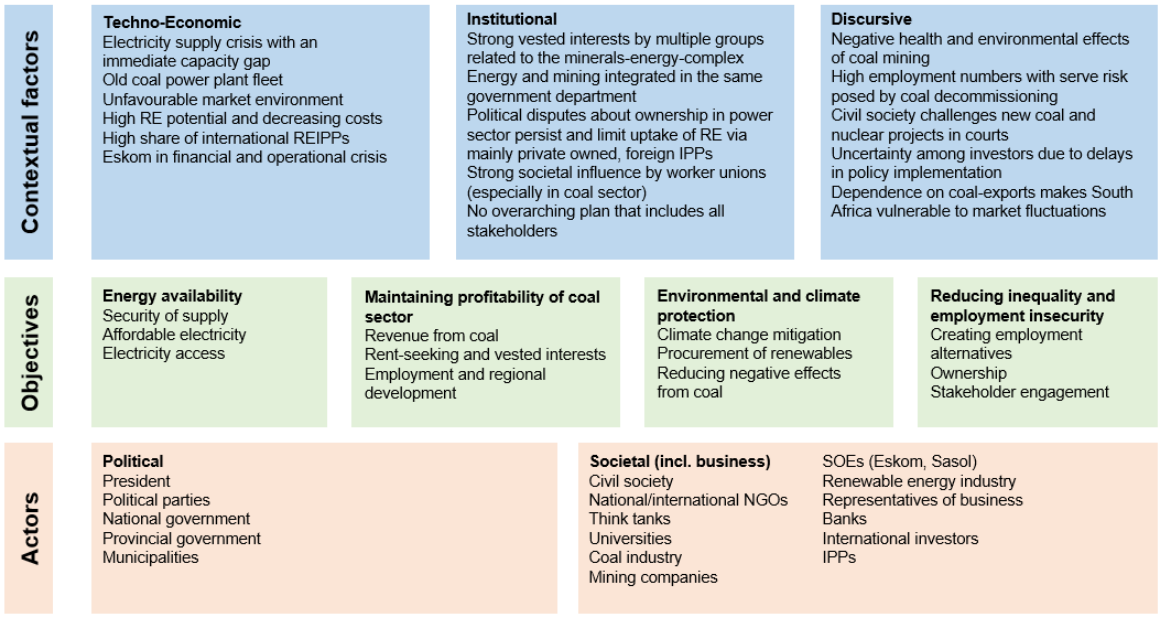
[10] The Just Energy Transition Partnership comprises of the governments of South Africa, France, Germany, the United Kingdom, the United States, and the European Union (termed the International Partners Group). The partnership commits to mobilise USD 8.5 billion over the next 3 to 5 years to advance the South African just energy transition.
[11] It is noteworthy that biomass constituted a primary energy source in 2000 (approximately 9%) however, there is no utility-scale biomass power generation at present in South Africa and, therefore, biomass not included in Table 5.

The increase in renewables presence in the energy mix is attributable to the REI4P, which has supported the implementation of 5 GW of operational renewable electricity-generation capacity since its inception in 2011. In 2020, the programme accounted for 5.6% of South Africa's total domestic electricity demand (HSRM, 2022:2). At present, 92 projects are listed on the government's renewables IPP database, including technologies: hydro, biomass, onshore wind, photovoltaic solar (various forms) and landfill gas (South African Government, 2022).

It is evident that incentives for South Africa to decarbonise are broad, and not limited only energy security through diversified sources and climate change mitigation. South African policymakers are also keenly aware of the potential to *leverage* the renewable energy transition to grow economically. Endowed with substantial renewable energy resources, strategic 'green' minerals and an advanced industrial base, a global shift to alternate energy sources presents South Africa with an opportunity to both achieve its GHG emissions reductions and economic growth aspirations by transforming its economy to create new alternative employment in emerging sectors as 'sunset' or 'yester-decade' industries decline.

Inspired by the work of Hanto et al. (2022), Figure 2 displays contextual factors, objectives and actors within the South African energy political economy.

Figure 2: Contextual factors, objectives and actors within the South African Political Economy



Source: Designed by author but based on Hanto et.al. (2022:167)

The renewable energy transition in South Africa, however, faces many of the same challenges which have characterised the country's pre-2009 energy political economy. To date, the renewables transition has been dogged by questions of job losses driven by civil and trade unions, the privatisation of the energy sector, energy affordability, social ownership and allegations/accounts of corruption and rent-seeking by the political elite.

Without significant and coordinated reform across the social, environmental market and public and political dimensions, the renewable energy transition offers South Africa little in terms of delivering a social and economically inclusive (just) transition. Additionally, while distributive justice and to a lesser extent procedural justice have dominated South Africa's energy planning to date, there remain substantial energy inequalities, which stand to be sustained or exacerbated through the transition to renewables, as explored in the following discussion sections.

4.2. Market Perspectives: Enabling the Just Energy Transition

4.2.1. Market Mechanisms and the Just Energy Transition

As demonstrated in the previous section, the market will undeniably play a prominent role in achieving a socially inclusive, JET for South Africa. In comparison to the broader SSA region, South Africa is advanced in its demonstrable commitment to leveraging market mechanisms and securing just (energy) transition financing. As illustrated, prior to the JTF (2022) and JET IP (2022), programmes such as the RE14P have grappled seriously with utilising the market (for example, through LCRs and ownership thresholds) to produce desired social outcomes. South Africa's recently launched JET IP is further evidence of this as it provides a roadmap to achieve a "long-term and well-managed transition to a low carbon economy" for South Africa (JET IP, 2022:3). The JET IP was formulated by the Presidential Task Team on Climate Finance (PTTCF) that was appointed in early 2021 and explores a range of opportunities for local and international capital providers to participate in a programmes and projects, through various funding instruments towards this goal.

Focussed on the period 2023-2027, the plan commits USD 98.7 billion (ZAR 1.48 trillion) in financing towards infrastructure, planning and implementation capacity, skills development, economic diversification and innovation, along with social investment and inclusion (JET IP, 2022:14).

The table below demonstrates the financing allocation per each category.

Table 6: Financing needs as per the JET IP for 2023-2027

ZAR (USD) billions	Electricity	New Energy Vehicles	Green Hydrogen	Subtotal
Infrastructure	978	83	313	1 374
Planning and implementation capacity	2.14	2	5.5	9.9
Economic diversification	40.4	43	-	83.4
Social investment and inclusion	9.6	-	-	9.6
Skills development			2.7	2.7
Subtotal	1 030.4 (68.7)	128 (9)	319 (21)	
Total				1 480 (98.7)

Source: JET IP (2022:14)

As per Table 6, the category with the largest financing needs for the South African JET is infrastructure at ZAR 1 374 billion. Across all financing categories, the electricity sector is anticipated to have the largest financing needs, with Green Hydrogen second, and New Energy Vehicles third and last.

The JET IP anticipates that within the specified period, the majority of needed funding will be sourced from the private sector (ZAR 500 billion), followed by the public sector (predominantly through DFI's) (ZAR 150 billion) and lastly through the Just Energy Transition Partnership (ZAR 128 billion). An outstanding amount of ZAR 700 billion remains to meet the target of ZAR 1 480 billion included in Table 6.

As discussed in the literature review section of this paper, auction policy instruments such as the REI4P have become increasingly popular to facilitate investment in renewable energy infrastructure globally. As the mobilisation of capital and public private partnerships will be key to scale renewable energy infrastructure, the Just Transition Framework (PCC, 2022:24) as well as the JET IP (2022:197) acknowledge the REI4P as paramount. The table below displays the country-wide spread of IPPs to date.

Table 7: Geographic spread of renewable IPP projects by South African province

Province	Number of REI4P Projects
Eastern Cape	17
Free State	5
Gauteng	1
Kwa-Zulu Natal	1
Limpopo	3
Mpumalanga	1
North West	5
Northern Cape	48
Western Cape	11
Total	92

Source: IPP Projects Database (2022)

This assessment of the REI4P's significance is accurate. Historically, the REI4P has facilitated more investment in four years than in the rest of the SSA region over the past two decades (Eberhard and Naude, 2017:1). A distinct advantage of the South African REI4P in comparison to the SSA region is its well-developed financial and banking sector, to provide debt to bidders. The role of DFI's would therefore be greater in other SSA countries with comparatively less

developed banking sectors. Eberhard and Naude (2017:91) also point to the future need to refinance IPP projects, creating a secondary market. Adequate regulation for and buy-in from commercial banking is therefore a priority for both South Africa and the greater SSA region.

This is not to say that DFI's have not played a prominent role in the South African REI4P; the Development Bank of South Africa and the Industrial Development Corporation (local DFIs) had contributed a combined ZAR 17.5 billion in debt financing by 2017, which was equivalent to 13.6% of total commitment to date (Eberhard and Naude, 2017:91). International DFI's had contributed roughly 7% (Eberhard and Naude, 2017:91).

There have however, been growing questions of the meaningful potential for market-based mechanisms to 1) mitigate to climate change and 2) deliver increased economic inclusion – both key dimensions of the JET. These questions hold weight for South Africa, particularly within the context of a global capitalist economy which has historically marginalised the African continent and relied on its structural dependency.

In an attempt to limit greenhouse gasses and slow global warming, the International Monetary Fund (IMF) in 2019 allocated the value of a single great whale as USD 2 million, and USD 1 trillion for the entire group of species currently living in oceans globally. Given the established knowledge that greenhouse gases warm the earth and that great whales 'capture' an average of 33 tons of carbon dioxide (carbon sequestration) during their lifetime,[12] the IMF posits that boosting the population of great whales can play a crucial and "non-tech" in mitigating climate change. In this light, "mitigating the many threats to whales involves compensating those causing the threats, a group that includes countries, businesses, and individuals. Ensuring that this approach is practical involves determining whales' monetary value," (IMF, 2019).

[12] The term great whales includes 13 species with the average lifespan across all spanning 50-200 years. Seven of the 13 species are considered either endangered or vulnerable (World Wildlife Fund, 2022).

Similarly, carbon credits allow permit holders to emit a certain level of greenhouse gases, with the aim to reduce this amount over time. Within the SSA region, Gabon was the first country to receive payment (USD 17 million) in 2021 for selling forestry related carbon credits on the international voluntary carbon market (UN Africa Renewal, 2021). Both the IMF's whale valuation and broader mechanisms such as carbon credits, green bonds and auction instruments are premised on engagement and buy-in with existing capitalist structures. There is growing disillusionment with the extent to which such 'green capitalism' mechanisms can enforce truly sustainable and socially just change, due to capitalism's inextricable role in the current ecological crisis and the continued economic marginalisation of the Global South.

The Intergovernmental Panel on Climate Change's sixth assessment (2021:53) draws an explicit connection between the role of human activity and the climate crisis – termed the Anthropocene, as well as the role of colonialism. The report also notes the historical role of the private sector in endorsing misinformation pertaining to climate change as well as being responsible for a myriad of unintended climate consequences, termed maladaptations.

Even within the West, triumphed mechanisms such as the European Union's Emissions Trading System (in effect for 15 years) have had a lacklustre impact on emissions reductions for the region, and have largely facilitated the transition from coal to gas, and not to longer-term renewable energy sources/technologies (Buller, 2022:272). Rising concerns are being reflected by European civil society organisations such as the Green Finance Observatory, who have recently advocated against the 'monetisation of nature' or a 'nature positive economy,' (Carbon Pulse, 2022).

In the words of Adrienne Buller (2022:274):

> *"…green capitalism reflects this blend of threat and opportunity…and seeks to transfer the complex, ethically and socially fraught, and inherently political questions presented*

by ecological crisis from democratically contestable terrain to the private authority of markets…"

From an economic standpoint, the renewable energy transition offers South Africa (and a number of SSA countries) the opportunity to leverage natural resources and manufacturing capabilities along renewable energy value chains. The World Bank estimates that the production of minerals and metals such as graphite, lithium and cobalt could increase by nearly 500% by 2050 spurred by the scaling of low carbon energy generation and storage technologies, for example. For most countries in Southern Africa, for example, mining contributes a significant part of foreign exchange earnings and around 10% of GDP. The demand, use and trade landscape of these commodities is hence an important economic driver within the emerging green global economy.

For example, South Africa's Hydrogen Society Roadmap is clear regarding the opportunity to produce green hydrogen using renewable energy advantages (solar, wind, space etc.) for export to international markets as well as to beneficiate the country's abundant Platinum Group Metals to produce fuel-cells and electrolysers.

Despite this, there is little evidence that green capitalism holds any potential to transform the historically exploitative economic relationship between the Global North and Global South, as it does not grapple with capitalism's logic of accumulation, production and consumption. Instead, emerging sustainability transitions (such as that of renewable energy) continue to benefit 'centre' countries at the expense of 'periphery' countries such as South Africa through existing relations of economic dependency (Ganguly, 2010).

In addition to the lack of structural transformation, within the SSA region green capitalist mechanisms have often been implemented half-heartedly. For example, in 2019 oil giant Eni announced plans to plant trees over 8.1 million hectares across South Africa, Mozambique,

Ghana and Zimbabwe to offset carbon emissions from current production, while concurrently announcing plans to expand operations on the continent (Buller, 2022:88). In fact, in 2021 Eni's emissions saw an increase from the year prior due to its increased activity in SSA, but offset this in 2 million tonnes of carbon dioxide equivalent in forestry-related carbon credits (Reed, 2022). Eni is not anecdotal, but instead reflects the approach of many private, market giants both globally and in SSA, by setting a sustainable, low-carbon agenda in the public-eye, while transforming marginally in actual practise with detrimental impact for restorative (social and environmental) justice.

Therefore, market-based approaches to broad based development (through renewable energy, for example) can lead to continued economic and social inequalities, undermining the JET agenda. We may, therefore, be faced with a "crisis of form" (Akomolafe, 2023) whereby in pursuing energy justice we are forced to rely on the very mechanisms which defy it and reinforce the current system.

Lessons from Degrowth[13] discourse on the need to transform underlying paradigms of accumulation, production and consumption – tenets of green and traditional capitalism – echo this crisis of form. It is to be seen whether the South African government adopts the recommendations put forth in the draft SAREM (2022) regarding the critical need to balance market needs with the need to develop local value chains through LCR's and social ownership through the REI4P.

[13] A direct translation from French's decroissance, Degrowth first emerged in the early 2000s as a social and political movement in Southwestern Europe to challenges market-based relations in society and advocate for equitable redistribution of wealth within and across the Global North and South in an ecologically sustainable way (Demaria et al., 2013:2019).

4.3. Public and Political Perspectives: Enabling the Just Energy Transition

4.3.1. Governing the Just Energy Transition: Lessons from the 1998 White Paper

South Africa's national electricity utility has faced severe public scrutiny over the past 15 years due to its mismanagement and inability to meet national demand. Following 1994, Eskom's new transformative role thrust the parastatal into popular politics, where it remains a site for contestation by ANC factions and the Tripartite Alliance (Bowman, 2020:406).

This high level of politicisation has played a central role in the utility's current crisis, demonstrating the importance of state capabilities, namely: the politics-bureaucracy interface; the institutional environment for (renewable) energy reform; and policy capacity and the role of the state with respect to the JET. At worst, South Africa's renewable energy political economy will be characterised by the same governance challenges of the coal-driven MEC and will do little to change the highly unequal nature of South Africa's economy and society. At best, strengthened state capabilities in the form of strategic policy design, implementation, institutional reform will lead to a paradigm shift, whereby a JET is attainable.

In particular, the years 1998 to 2018 are often cited as transformative for state and political discourse on renewables and electricity generation in particular, owing to the introduction and consequent developments of the White Paper on Energy Policy (1998). The White Paper remains a relevant case to explore state capabilities and implications for the South African renewable energy transition today.

As demonstrated in a previous section (see Figure 2) of this paper, the actors which comprise the South African energy institutional environment are varied. While Eskom falls under the South African Department of Public Enterprises as a parastatal, it is regulated jointly by the Department of Minerals and Energy and National Electricity Regulator of South Africa

(NERSA). The mandates of other state departments such as that of Trade, Industry and Competition and Forestry, Fisheries and the Environment similarly shape the domestic energy context.

Non-state actors feature prominently in the country's energy political economy as well. Major industry (e.g., through associations such as the Energy Intensive Users Group of Southern Africa) and unions such as Congress of South African Trade Unions (COSATU) and the National Union of Metalworkers of South Africa (NUMSA) have played an influential role. For the purpose of this paper, non-state actors are included in the conceptual understanding of an institutional environment and policy capacity.

Proposed by the DMRE, the White Paper put forth a range of reforms including the unbundling of Eskom's three-step generation, transmission and distribution system and the gradual privatisation of the generation sector by directing that all new generation capacity be privately built (Trollip et al., 2014:11). These reforms would necessitate the introduction of IPPs as well as the establishment of an independent grid and an independent energy regulator and ultimately, the de-monopolisation of the energy sector. Up to 30% of Eskom's market share would be reduced and the utility would be prevented from investing in new energy generation projects within South Africa. Notably, the White Paper signalled the need for investment in additional generation infrastructure (by the private sector, not Eskom) to maintain the demand-supply balance, accurately predicting the utility's electricity crisis a decade later.

As the proposed reforms meant a fundamental change of Eskom's role and market share and given the need for IPPs to sell power to the Eskom-owned transmission and distribution infrastructure, buy-in from the utility was essential. Additionally, the proposed department responsible for contracting IPPs and facilitating this novel IPP-Eskom relationship (DMRE) had little technical/operational know-how and held limited institutional and political credibility

to compel Public Enterprises (Eskom's parent department) to coerce Eskom to share this know-how in light of its resistance against IPPs. Cabinet later determined that the DMRE also failed to develop the needed legal and regulatory to implement this restructuring of the electricity sector (Trollip et al., 2014:11).

As Trollip et al. (2014:12) notes, for years leading up to 1998 the introduction of IPPs had been hotly debated within and between the Tripartite Alliance, national government and Eskom management with the latter firmly opposed. This debate was situated within a larger debate on the role of parastatals and private capital in the newly democratised South Africa. As explored in the literature review section of this paper, privatisation is often framed as the most conducive strategy for renewable energy reform as, in theory, it means the removal of state bureaucracy and politics and encourages a focus on efficiency, cost, customer experience and profit (Zhang and Speed, 2020:3).

However, given that the reforms required active support from Eskom (due to the DMRE's lack of technical knowledge and legal/regulatory framework), Eskom adopted a 'no action' approach and the implementation of the White Paper was effectively blocked. Eskom's complex regulatory and accountability structure with regards to the DMRE and DPE is regarded as a loophole which renders it "subject to makeshift governance," (Ting et al., 2020:15). Fierce opposers of the policy also included the Tripartite Alliance whose concerns – namely the loss of jobs and livelihoods for coal mining communities – reflect elements of JET current discourse today.

Heavy industry too had a vested interest in maintaining the electricity market status quo; many industry players had longstanding, favourable contracts with Eskom which were jeopardised through the proposed IPP restructuring. This persists today; in 1996 a contract was signed between the utility and mining giant BHP Billiton for the sale of electricity at less than one-

fifth of the tariff paid by consumers for power at two of its aluminium smelters until 2018 and 2026 (eNCA, 2013). Ting et al (2020:23) highlight that heavy industry has continued to support Eskom's resistance against the introduction of IPPs. In 2006, regulator NERSA held a series of public forums on Eskom's operations following the introduction of a new pricing methodology by the utility. The EIUG declined to attend the hearings, citing that maintaining a (positive) relationship with Eskom was a priority (Ting et al (2020:23).

In short, despite the necessary institutional environment, the DMRE lacked the policy capacity and political legitimacy to realise the White Paper. As described earlier in this paper, policy capacity is understood as the ability of both state and non-state actors to make sound choices, perceive policy alternatives and their implications and ultimately, implement policy choices (Wu et al., 2018:2).

It would take the DMRE a further ten years to develop and implement the requisite Electricity Regulation Act (2006) to facilitate the contracting of IPPs and another five for the REI4P to be launched in 2011. The programme further encountered difficulties when it faced a two-year suspension due to various factors (namely infrastructural challenges and non-cooperation by Eskom) between 2016 and 2018. Following the resumption of the programme in 2018, the then newly appointed energy minister Jeff Radebe noted that the signing (to the value of ZAR 56 billion and capacity of 2300 megawatts) signalled a new dawn for renewables in South Africa, following "a long period of uncertainty, not only for the renewable energy industry, but also for private sector investment in the energy sector," (Creamer, 2018).

Notably, the South African government announced in January 2023 that Eskom is to be moved from the DPE to the DMRE (Goosen, 2023). The move would resolve the parastatal's structural accountability issues, giving the DMRE the direct power to implement the policy choices it designs and ideally, enhancing the utility's governance. The decision has however garnered

widespread criticism from the public, owing to the DMRE Minister Gwede Mantashe's public image as a "coal fundamentalist" due to the slow procurement of renewable energy under his leadership (Paton, 2022). In addition, the DMRE has recently faced a slew of its own challenges relating to infrastructural maintenance and bureaucratic transparency. These include mining rights backlogs, the inability to provide mining production data and a report by the Auditor-General which highlights the DMRE's mismanagement of over 2000 derelict mines, posing safety risks to community's country-wide (Stoddard, 2022; Auditor-General, 2022).

These incidences point to its incapability to resolve its own challenges, let alone those of Eskom's as well as the multi-faceted challenges posed by the JET. These policy capacity concerns therefore hold significant implications for the achievement of a JET given the DMRE's role in energy agenda-setting for the country and Eskom's central role in the energy political economy.

Despite its challenges, the ongoing REI4P – led by the DMRE – is widely lauded as a success both domestically and internationally. In particular, an often-cited success of the South African REI4P across academic and industry alike has been the comparatively well-developed public institutional environment, which has strong communication, the value of openness and trust-building with the private sector for example, by the National Treasury PPP Unit. This has translated to a high sense of perceived credibility of evaluation and tender allocation processes and the meeting of stipulated deadlines and on-time payment by Eskom to IPPs. RE14P's continued success signals that – if governed carefully and with mutual incentives – South Africa does possess the needed institutional environment and policy capacity to realise a just energy future.

Another often cited success-factor of the REI4P's is South Africa's comparatively (across SSA) well-developed policy framework oriented towards boosting both private capital and

renewables in the energy sector. These policies (summarised in Table 8) are critical as they will ultimately determine the viability of a JET for South Africa.

Table 8: Overview of policies for the JET

Policy	Year	Body	Objective / Scope
Integrated Energy Plan (IEP)	2016	DMRE	• Overarching and long-term energy planning framework to ensure security of energy supply in South Africa • Aimed at improving energy governance to support targeted policies already in existence • Puts forth four scenarios based on assumptions relating to national policy imperatives and economic future
Integrated Resource Plan (IRP)	2019	DMRE	• Electricity infrastructure development plan focussed on energy security and mitigating carbon emissions • Stipulates annual build limit of 1600 MW for wind and 1000 MW for solar PV (ideally until 2050) • Puts forth five scenarios including the decommissioning dates of existing generation plants and the potential removal of annual build limits for renewable energy infrastructure
Just Transition Framework	2022	PCC	• A framework to facilitate a just transition to a low-emissions and climate-resilient economy • Puts forth that a just transition contributes to the goals of decent work for all, social inclusion, and the eradication of poverty • Supports South Africa's broader efforts to redesign the economy to benefit 'most' citizens to enable to deep, just, and transformational shifts

Hydrogen Society Roadmap	2022	DSI	• National coordinating framework to facilitate the integration of hydrogen-related technologies in various sectors of the South African economy • Establishes a hydrogen-development model which included 70 strategic actions to 'unlock' South Africa's hydrogen potential • Aims to achieve a just and inclusive net-zero carbon economic growth for societal wellbeing by 2050"
Just Energy Transition Investment Plan	2022	Presidency	• Provides a roadmap for South Africa to achieve a long-term and well-managed transition to a low carbon economy • Commits USD 98.7 billion (ZAR 1.48 trillion) in financing towards infrastructure, planning and implementation capacity, skills development, economic diversification and innovation, along with social investment and inclusion for the period 2023-2027
South African Renewable Energy Masterplan (SAREM)	In progress[14]	DMRE	• Presents roadmap for industrialisation through renewable energy manufacturing value chain in South Africa • Aims to enable inclusive participation in the renewable energy transition and to diversify fossil-fuel-dependent economies to ensure a just labour transition (i.e. Mpumalanga province)
Climate Change Bill	2022	DFFE	• To enable effective climate change response and a long-term, just transition to a low carbon and climate resilient economy. • Puts forth a range of instruments, including the development of national adaptation objectives, a Presidential Climate Commission (PCC), sectoral

[14] A draft of SAREM was made available by the DMRE in March 2022, while the final version is yet to be published.

			emissions targets, carbon budgets and municipal forums on climate change.

The policy impact of the 1998 White Paper is evident across those included in Table 8. A common thread across these key policies is the aim to digress from the vertically integrated and monopolistic nature of the South African energy sector towards greater supply security, access and sustainability. Similarly, the 2003 White Paper on Renewable Energy (which built on the 1998 policy but with a sole focus on renewables) is a foundational policy for present-day renewable energy agenda setting. The 2003 policy supported the liberalisation of the energy sector through IPPs, and acknowledged the need to set the necessary institutional, regulatory and financial environment which led to the implementation failure of the 1998 policy.

Unique to the SSA region, South Africa also boasts two just transition policies – the JTF (2022) and JET IP (2022). And while the government has announced the decision to move Eskom from the DPE to the DMRE to improve the utility's governance, the JTF (2022) and JET IP (2022) similarly signal a shift in energy governance structure. Until the launch of the respective just transition documents, energy policy (evidenced by Table 8) was led by the DMRE, while the country's NDC's were led by the Department of Forestry, Fisheries and Environment (DFFE). These separate policy processes were not aligned with each other as envisaged, for example, in the National Development Plan (2012) which called for a "transition to a low-carbon, resilient economy and just society." This dualist policy-making structure was overcome when the President established the PCC (policy owners of the JTF and the JET IP) in 2020.

Therefore, the combination of the JTF (2022), JET IP (2022), the Hydrogen Society Roadmap (2022), the updated Intended Nationally Determined Contribution tabled at COP 27 (2022) and

the developing Climate Change Bill (2022) demonstrates that South Africa has inspiringly (but only very recently) succeeded in merging its decarbonisation commitment with its socio-economic agenda.

A study by Muller et al. (2020) which maps the presence of energy justice in renewable energy policies in 34 African countries and their alignment with SDG 7 found that South Africa is one of only three countries with comprehensive policy frameworks. The policy frameworks deemed comprehensive by the study strategically leverage the cross-cutting qualities of the energy transition through market instruments and state intervention, while also addressing domestic challenges such as gender inequality.

However, as discussed, policy capacity constitutes not only the ability to design policy but also to implement policy choices. Therefore, it is of great significance *how* key actors collaborate around policy frameworks. With respect to the JET, themes of local renewable energy value chain development and social ownership constitute are recurrent across policy documents due to the potential for significant socio-economic transformation. Detailed exploration of this is undertaken in the sub-chapter on Local Content and Social Ownership.[15]

While the 1998 White Paper was introduced close to three decades ago, exploration of the case holds valuable lessons for the intricate and highly politicised nature of South Africa's energy governance landscape, which may impede future energy policy design and implementation and more broadly, the achievement of a JET. It is evident that reform of the energy sector towards the JET must be accompanied by an acute understanding of the embeddedness of coal in communities, institutional and technical capacity challenges (including a weak politics-bureaucracy interface) and normative ideals held by citizenry and political elite alike on the role of the state. Encouragingly, Eskom established a JET office in early 2020 signalling the

[15] See chapter 5.4.1. Local Content and Social Ownership in the Just Energy Transition, page 59.

future alignment of the utility with both the 'net zero' carbon emissions and inclusive socio-economic agenda (Eskom, 2020).

4.3.2. Infrastructure for the Just Energy Transition

As discussed, a key dimension of policy capacity is the ability to not only appropriately design but also implement policy choices. Infrastructure is a critical determinant of the ability to execute such choices, and importantly, provides a central site for public and private actors alike to coalesce. It is evident that at present, there remain grave mismatches between the needs of decarbonised technologies and our existing systems (Buller, 2022:67).

With respect to the renewable energy transition, the role of REI4P has been explored as a means to leverage competitive market forces to bridge gaps in state capital and build needed infrastructure. However, even outside of the REI4P, there is no shortage of promising infrastructural projects on South Africa's energy horizon. The Hydrogen Society Roadmap, for example, identifies a number of green hydrogen related projects (predominantly export-oriented) including the Hydrogen Valley Initiative, the CoalCO2-X project and the Boegoebaai Port and Green Hydrogen Cluster.

There are, however, a number of more rudimentary infrastructural challenges which have long plagued South Africa's energy system, and which will inevitably hinder the achievement of a JET. As per the JET IP (see Table 6), the category with the largest financing needs for the South African JET is electricity infrastructure. This is therefore a priority area within the JET IP (2022:9) in order to:

(1) manage the decommissioning of the retiring coal generation fleet, in line with a revised Integrated Resource Plan (IRP) and in tandem with the development of renewable energy generation at scale and pace;
(2) timeously strengthen the transmission grid infrastructure to accommodate the shift to renewable energy;
(3) modernise the electricity distribution system.

The JET IP's prioritisation of electricity infrastructure is not unwarranted. As the South African JET will constitute not only a thriving energy-export economy but also decreased energy poverty, the development of the country's transmission grid is critical.

While Table 4 notes a steady increase in electrification rates in both urban and rural settings in South Africa, energy poverty extends beyond this narrow conceptualisation, including not only electricity access but security and affordability for citizens as well.

The International Energy Agency (2014) notes that while there is no single internationally accepted definition of modern energy access, there are commonalities across definitions, including:

1. Household access to a minimum level of electricity;
2. Household access to safer and more sustainable (i.e., minimum harmful effects on health and the environment as possible) cooking and heating fuels;
3. Access to modern energy that enables productive economic activity, e.g., mechanical power for agriculture, textile and other industries;
4. Access to modern energy for public services, e.g., electricity for health facilities, schools and street lighting.

In July 2022 the African Union adopted the 'African Common Position on Energy Access and Just Transition,' a document which maps the continent's energy development pathways to

accelerate universal energy access and (green) transition without compromising its development imperatives. Ensuring the alleviation of energy poverty for citizens is therefore duly recognised as a critical component of energy justice within South Africa's transitioning energy political economy.

As the majority of the country's coal fleet is situated in the Mpumalanga province (north-east), the majority of transmission infrastructure has been historically centralised there. This poses a challenge for renewables as the majority of solar and wind potential is concentrated in the north-west of the country. Therefore, the disconnect between where the future resources are located and where the current infrastructure exists needs to be addressed to realise the JET. To some extent, Eskom's Transmission Development Plan (2019:30) seeks to address this, acknowledging that renewable generation is the primary driver of transmission network development, particularly in the Western Cape, Northern Cape and Eastern Cape provinces.

Renewable Energy Development Zones (REDZ) have emerged as valuable mechanisms for the JET as they identify priority areas to be targeted, for example by Eskom's Transmission Development Plan, alleviate bureaucratic 'red tape' facing IPP's and encourage localised renewable energy project development. There are currently eight[16] REDZ in South Africa for large scale wind and solar photovoltaic facilities (DFFE, 2021).

The role of municipalities, too, is undergoing reform given the introduction of renewable IPP embedded generation[17] and the consequent re-conceptualisation of municipal electricity distribution models and accompanying political interests (Montmasson-Clair, 2017:6). This is in addition to challenges of aging distribution infrastructure exacerbated by loadshedding. Notably, development projects focussed on household connectivity (to expand access) are

[16] The eight identified REDZ are: Overberg, Komsberg, Cookhouse, Stormberg, Kimberly, Vryburg, Upington and Springbok. Three additional REDZ (Klerksdorp, Emalahleni and Beaufort West) are proposed (DFFE, 2021).
[17] Embedded generation refers to the production of electricity from small scale power stations, connected to the distribution grid for both self-consumption and for the sale of excess power to the grid (DBSA, 2022).

unattractive for private sector players due to high capital costs and low initial consumption by beneficiaries, leaving distribution largely in the hands of capacity constrained local governments (SADC Energy Monitor, 2016).

Aside from the evident implications for energy poverty posed by South Africa's current infrastructural challenges, the JTF (2022:16) highlights the importance of developing climate resilient infrastructure relating not only to energy, but also transport, city design and housing for the just transition. Cross-sectoral 'climate-proof' infrastructure will be critical to support the JET and enhance the adaptation and mitigation capacity for communities as climate change advances. The JET IP (2022) echoes this inclusive view of infrastructure, demonstrating investment needs for New Energy Vehicle charging stations and the conversion of public transport systems to low carbon technologies, to name a few.

4.4. Social and Environmental Perspectives: Enabling the Just Energy Transition

4.4.1. Local Content, Social Ownership and the Just Energy Transition

At the centre of emerging renewable energy and JET policy discourse in South Africa is the role of local content requirements[18] (LCRs) and social ownership given the country's highly unequal distribution of wealth. These requirements of renewable energy value chains are prominent features of policies such as the draft SAREM (2022), the JTF (2022) the JET IP (2022) with the latter calling for a "diversely owned renewable system and a broadening of ownership of productive assets in support of a just transition," (JET IP, 2022:196).

[18] Local content requirements refer to the requirement that a minimum level of goods and services are procured and/or manufactured locally.

As detailed by the JET IP (2022:196) social ownership within the renewables economy is possible through a multitude of models including state ownership at different levels (i.e. municipalities), employee ownership, co-operative ownership and individual ownership (including through equity in private companies).

Similarly, the ownership requirements of the REI4P (49% South African shareholding with minimum ownership of 25% black persons and 5% black women) and the LCRs (40% threshold) responds to need for increased restorative energy justice (Pinto, 2021). Since the programme's inception in 2011, local community (typically 50 kilometres or a district boundary around a renewable energy project site) ownership too has been a requirement for IPP company structures. This requirement is often met in the form of a community trust, which have an average of 9% total shareholding in the sector and ZAR 27 billion nominal net income to benefit project host communities for at least the 20-year PPA period (JET IP, 2022:197).

Such content and ownership requirements across energy policy instruments are aimed at improving the socio-economic standing of vulnerable groups through increased and long-term inclusion in the renewables economy, namely by providing opportunities for technology and skills transfer. Despite this, increased competition, onerous regulatory requirements and a tokenistic approach to ownership requirements have resulted in consistently higher levels of foreign and non-black economic empowerment (BEE) ownership within the REI4P (Overy, 2019:14).

A 2014 World Bank study highlights that international experience with auction instruments similar to the RE4IP demonstrate that LCRs have proved more effective at ensuring desired socio-economic outcomes, than ownership requirements have (Eberhard et al., 2014:28). Despite this, and given South Africa's unique post-apartheid context, ownership (alongside

local content) constitutes a key dimension of restorative energy justice as per the JTF (2022:22).

The draft SAREM (2022:20) explores a market-led approach to local content for future programmes, which would see no minimum threshold set by the state, ideally allowing for the "market to respond with its own optimal supply of local content." However, the policy document highlights a critical shortcoming of this unregulated content approach: the inability to align the scaling of renewables in South Africa with desirable contextual outcomes such as the JET. The draft policy argues that a government-controlled approach (with high minimum thresholds for local content, such as is the case with REI4P) leads to the slow and high-cost roll-out of renewables.

Instead, SAREM (2022:20) puts forth a combination approach, with low minimum thresholds to be increased gradually over time. Notably, SAREM (2022:22) also advocates for strategic localisation as opposed to "whole of-value-chain" localisation, to mitigate the fast pace of technological change within the renewables sector and to protect worker livelihoods.

While the REI4P is widely regarded as a success for South Africa, there are arguments that high financial costs and lack of community consultation have disenfranchised local communities, and thereby limiting the developmental impact of the programme pertaining to poverty and inequality i.e., through the establishment of community trusts and bursary schemes (Wlokas, 2015:2). A study by Project 90 by 2030, demonstrated that not only have the decision-making powers for community owners in South Africa been nominal, social ownership requirements have had also lacklustre outcomes with consistently higher levels of foreign and non-BEE ownership (Overy, 2019:17).

As discussed, gender constitutes an REI4P ownership requirement as well. However, it is increasingly evident that achieving gender equity for the South African JET will require much more than minimum threshold percentages.

A 2018 study (Parshotam and van der Westhuizen) show that the South African renewable energy sector is male dominated at both leadership and technical levels. In this light, the study emphasises the need for establishing supportive science, technology, engineering and math (STEM) education pipelines to increase the number of women in the renewable energy sector. This sentiment is also echoed across policy documents such as the JTF (2022:9) and Hydrogen Society Roadmap (2022:82). However, data from the Technical Vocational Education and Training (TVET) sector – critical for skills input for the renewable energy economy – tells a different story about gender and employment in South Africa.

According to the Department of Higher Education and Training, women have consistently exceeded men as enrolled TVET learners, however, the unemployment rate of women (particularly black women) is persistently higher than that of men (DHET, 2022:6; Statistics South Africa, 2021). This reflects either weak skills-industry linkages or entrenched patriarchal values which inhibit the inclusion of women in medium to high-skilled roles even if women hold the requisite skills. Ensuring gender equity within the South African renewable energy economy will, therefore, require concerted efforts by both government and the private sector alike to reform industry culture and occupational norms, in addition to gender inclusive skills development.

4.4.2. The Environment and the Just Energy Transition

South Africa was the first country to include the notion of a just transition in its Nationally Determined Contribution (2021), which details intended efforts taken to reduce national carbon

emissions under the United Nations Framework Convention on Climate Change. The NDC (2021:4) outlines a low-emissions energy system as central to the country's climate change mitigation strategy and central to the JET. It also acknowledges that enshrined in the constitution is the right to a safe and healthy natural environment for citizens.

Globalisation as well as the deregulation of the market following the end of Apartheid has seen the rapid rise of consumerism in South Africa and consequently, the rise in carbon emissions (Andrews, 2017:14). This process also saw the increased extraction of minerals and metals as a part of the minerals-energy-complex. Environmental degradation caused by mining in South Africa is well evidenced, including not only high carbon emissions (air pollution) but also acid drainage and water pollution. For coal mining in particular, these detrimental effects are evident in provinces such as KwaZulu-Natal, Limpopo and Mpumalanga, whereby pollution-induced respiratory diseases are common.

In the Gauteng province alone, 1.6 million people live on mine dumps that are contaminated with uranium and toxic heavy metals, including arsenic, aluminium, manganese, and mercury. Countless others live in rural and highly congested urban areas often adjoining working or abandoned mines, coal-fired power stations, steel mills, incinerators and waste sites, while access to clean air and water, electricity, sanitation, and refuse removal remain unaffordable or entirely unavailable (Räthzela *et al*., 2018:506).

Eskom and Sasol (state-owned petrochemical giant) are regarded as the biggest polluters in the country, with the Mpumalanga province in particular being home to 15 Eskom-owned coal power stations. Accordingly, the province was declared an air quality priority area in 2007 (Shongwe, 2018:20).

As the seventh largest producer of coal (Jain and Jain, 2017:722), decarbonisation of the energy sector therefore presents significant opportunities for environmental restoration in South

Africa, standing to benefit the natural ecosystem and communities alike. As explored under the sub-chapter on JET market mechanisms, carbon offsetting schemes are growing in popularity across SSA by major extractive industries, which aim to restore the natural environment, while on the other hand maintaining or even increasing (as in the case of Eni) extractive activity.

In comparison to the broader SSA region, South Africa is advanced in its utilisation of green market mechanisms, having introduced a carbon tax in 2019 and having the highest number of green bonds issued across Africa, in the sectors of energy, buildings, transport, water and waste and totalling USD 1.56 billion (Marbuah, 2020:9). Notably, a national carbon offsetting framework, led by the DMRE is currently in development (DMRE, 2022). However, the efficacy of such mechanisms in restoring the natural environment through the JET is questionable. Carbon offset projects are often criticised for simply displacing emissions from one location to another, rather than reducing them overall. Additionally, some offset programs may not provide long term, significant emissions reductions, or may not have robust enough standards to ensure that the emissions reductions claimed are real and permanent.

Therefore, while such green market mechanisms are critical for bridging the significant climate finance deficit in South Africa, they cannot be viewed as long-term substitutes for reducing emissions at the source given capitalism's inextricable link to the current ecological crisis. Other instruments, such as Environmental Impact Assessments (EIAs) – required by South African environmental law since 1998 for particular activities – intend to ensure that possible impacts which developments may impose on the environment are identified and that mitigation measures are designed and implemented (Mahloko, 2019:14; DFFE, 2017:1).

Similarly, the outcomes of these preventative mitigation reports within the energy sector have been lacklustre. Current South African EIA requirements have been found to be insufficient to

adequately measure and communicate accurate ecological and social impacts of renewables development (Boshoff, 2019 and Mahloko, 2019:14). One study showed that only 68% of South African renewable energy related EIA reports were satisfactorily conducted and complex assessment tasks such as determining the extent of environmental impact, alternatives, mitigation measures and the communication of findings were rudimentary (Boshoff, 2019).

In addition, a study by the International Institute for Sustainable Development (Bridle, 2018:5) found that social and environmental costs of fossil fuel related energy activity far exceed South African environmental taxation standards, undermining the efficacy of such regulatory instruments to curb carbon emissions and offset social and environmental costs of South Africa's energy sector.

Encouragingly, sustainable land-use practises (such as the repurposing of coal mining land) form part of both the JTF (2022) and JET IP (2022) while the latter briefly acknowledges the risk of harm by activities in "environmentally sensitive" regions (JET IP 2022:143).

4.4.3. Labour and the Just Energy Transition

Arguably, the most commonly toted positive externality of renewable energy scaling in South Africa is job creation. This is echoed across the majority of national energy and just transition policy frameworks, which point to the alleviation of unemployment as a priority. While JET discourse has broadened its narrow focus on labour since the 1980s, job creation is still a critical concern as significant changes to the size and nature of labour forces are anticipated as some sectors wane (sunset sectors) and others emerge (growth sectors) due to the decarbonisation of industries.

Indeed, the imperative to shift from fossil fuels to renewables is not only to mitigate the current global ecological crisis (which has led to toxic pollution, rising food and energy prices, biodiversity loss, crop failures, water shortages, and dislocation in South Africa) but also to create more economically inclusive development trajectories (Räthzel *et al*., 2018:506). South Africa's national unemployment rate of 34.5% (63.9% for those aged 15-24 and 42.1% for those aged 25-34 years) mean that mitigating job losses through the energy transition is paramount (Statistics South Africa, 2022).

There has, therefore, been marked public debate pertaining to renewables and the future of South African workers since (at least) the 1998 White Paper on Energy. The Congress of South African Trade Unions (COSATU) (the largest federation of trade unions in the country) fiercely opposed the liberalisation of South Africa's energy sector through the introduction of IPPs. Accordingly, COSATU led a campaign against the 1998 White Paper, citing job losses, higher energy prices for consumers and a lack of government transparency. While the introduction of renewable IPP's into the country's electricity market was of course successful, COSATU as well as and the National Union of Metalworkers of South Africa (NUMSA) have maintained concerns. Following the signing of the first REI4P PPA's in 2018 (as discussed previously) a number of court challenges were brought forth by NUMSA, as they called for a "transition from coal to renewable energy [which] does not negatively affect workers and the community at large," (NUMSA, 2018).

The concerns of South African labour are not undue. Given the global phaseout of coal, what will happen to the roughly 90,000 people currently employed in South Africa's coal mining sector (Minerals Council of South Africa 2018)? Similarly, what will happen to the 112,000 people employed in the traditional automotive industry when internal combustion engines and the catalytic converters that power them are phased out in lieu of electric vehicles and the many

others employed in highly pollutant industries such as cement, iron and steel production (Naamsa, 2019)? In addition, a key consideration of the JET with respect to labour is not only the availability of jobs, but the availability of *decent* jobs constituting fair income, workplace security and social protection (ILO, 2023).

As explored previously in the paper, the total number of current renewable IPP's stands at 92 (Table 7) while significant employment gains have been incurred through the programme. An estimated 40,134 direct, full-time equivalent job years had been created through RE14P by 2019 (Muller and Claar, 2021:339). Notably, the LCR's of REI4P projects have created localised job creation of both direct and indirect (induced) nature. However, the majority (47%) of job creation through REI4P to date has been during the construction phase of projects, making them temporary (estimated as the first two years) (COBENEFITS, 2019:14). Significantly fewer workers are needed to maintain plants following the construction completion, bringing into question the sustainability of a JET through the REI4P and emphasising the importance of social ownership.

Nonetheless, COBENEFITS (2019:14) estimates that a typical 86 megawatt solar PV power plant creates 950 direct jobs and 3 670 job years over its lifespan. A further study by the South African Institute of International Affairs (SAIIA) (2022) forecasts the creation of up to 2.5 million jobs within the green hydrogen economy alone. In contrast, jobs in the coal sector are estimated to decline by 35 – 40 % between 2020 and 2050 (COBENEFITS, 2019:19) due to decreasing international demand and domestic reliance for power generation.

Therefore, while the job creation potential through renewables in evident, there are warranted concerns regarding the timing of growth sectors (such as renewable energy generation) and sunset sectors (such as coal) and the implications for worker livelihoods during the transition. Given quantitative modelling undertaken by SAIIA and the University of Cape Town's Energy

Research Centre (2022:89), the coal sector will decline before the respective renewable energy sectors boom, demonstrating the urgent need for a coal sector employment mitigation strategy by the South African government. There is, however, evidence that the South African government is aware of the dire need for mitigation. A critical outcome of Eskom's JET Office establishment was the socio-economic impact study for the shutdown and repurposing of the coal-fired Komati power station, located in Mpumalanga province. The report concludes that without mitigation, the shutdown of the power station will result in significant economic and labour losses, as well as the deterioration of living standards, quality of life, and the state of surrounding communities (Eskom, 2022:11).

In addition to bridging this timing discrepancy, securing a just transition for South African workers will also mean skills anticipation to meet future green industry demand. Specialised skills required in the renewable energy sector include solar and wind component manufacture and distribution, project development, construction and installation, and operation and maintenance (Bhagat & Wolf, 2021). Cross-cutting skills include ones related to occupational health and safety, quality assurance, and certification and compliance (Bhagat & Wolf, 2021).

There does appear to be demonstrable awareness by South African policymakers of this need. For example, the Hydrogen Society Roadmap (2022:84) makes brief mention of the establishment of a Just Transition Centre to "focus on re-skilling marginalised communities to take up opportunities in new and emerging energy areas, such as hydrogen and fuel cells, batteries, carbon capture and use, and RE technologies" and predict future skills demand. Similarly, the JTF (2022), JET IP (2022) and Eskom's socio-economic impact study (2022) identify skills as central to enable South Africans to participate in industries of the future and achieve both restorative and distributive justice through the transition.

Accordingly, four dimensions of skills development are outlined within the JET IP (2022:99): reskilling and upskilling (to enable the transition of existing workers between sunset and growth sectors); aligning the skills development system with the anticipated labour force needs of the future; ensuring foundational skills throughout the education system; and addressing gender, inequality and social exclusion.

In particular, the TVET public college system will be critical to ensure a just labour transition for South Africa's coal workers, as the bulk of job creation in renewable power generation is estimated to be within the high-skilled labour group, defined as workers with an educational attainment level above Grade 12 (COBENEFITS, 2019:23). The majority of TVET-educated workers in South Africa are employed in occupations classified as semi-skilled (55% of TVET workers), followed by high-skilled occupations (36% of TVET workers) (SAIIA, 2022:36). However, the TVET system in South Africa – although recognised by government and civil society as a tool for social and economic transformation – has long battled severe funding constraints, poor education and training outcomes and an inferior public image (SAIIA, 2022:37-46). Hefty public investment, appropriate curriculum reform and enhanced collaboration with emerging sustainable industries are therefore required to ready the TVET system for the JET.

As discussed in the earlier sub-chapter on Local Content and Social Ownership, the TVET system will also be critical for enhancing gender equity within South Africa's renewable energy economy.

4.5. Findings and Recommendations: Prioritising Restorative Justice for the South African Just Energy Transition

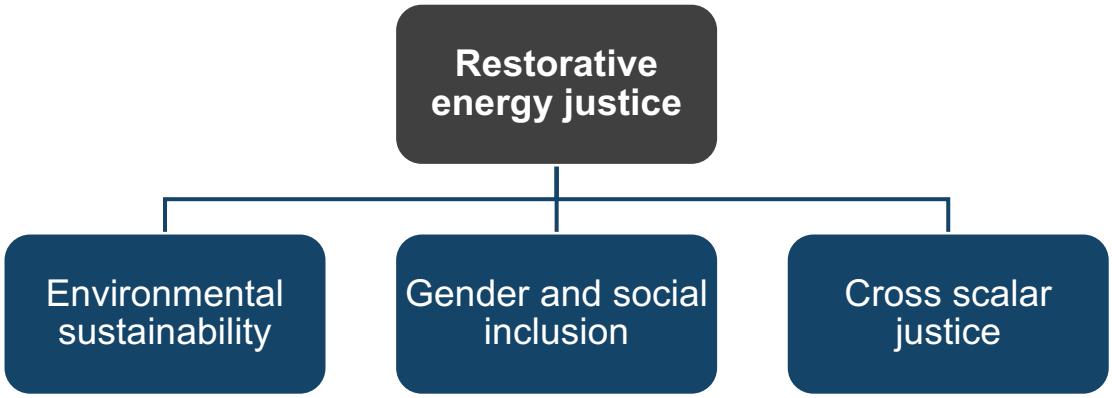
As evidenced across the discussed dimensions (market, public, political, social and environmental), South Africa's approach to energy planning to date has been dominantly distributive in focus i.e., aiming to secure equitable energy access for citizens. Procedural justice has also featured prominently through comprehensive energy policy aiming to democratise energy-related decision making i.e., through the focus on community and social ownership. This dominance of traditional energy justice principles across the South African energy political economy is warranted given the highly unequal infrastructural and social development due to its Apartheid history as well as the country's persistent and dire electricity supply challenges.

This paper argues, however, that a narrow focus on distributive justice and procedural justice is no longer fit-for-purpose and that, going forward, South Africa's JET efforts must be restorative in nature due to redress entrenched socio-economic inequalities. Restorative energy justice is important as it addresses systemic inequalities in the energy sector, in contrast to the retributive or corrective approaches of distributive and procedural justice.

This is reflected in the working definition of South African JET created in this study, which aims for: the transition from a fossil-fuel based energy system towards a low-carbon system, which fosters environmental sustainability, gender and social inclusion and cross-scalar justice with a particular focus on redressing disenfranchised demographics. Encouragingly, the inclusion of restorative justice by the recent JTF (2022) and JET IP (2022) signal that South African policymakers are aware of its potential contribution.

The following discussion will present the three principles of restorative energy justice as per Figure 3, as applied to the case of South Africa with recommendations for enhanced environmental sustainability, GESI and the delivery of cross scalar justice. Exploration of these three principles will demonstrate the role of restorative energy justice in mitigating inequality through South Africa's low carbon energy transition including by identifying distinctly restorative policy and regulatory mechanisms to support the JET agenda.

Figure 3: Principles of restorative energy justice



Source: Author

4. Environmental Sustainability

The JTF (2022:2-5) repeatedly notes that the imperative for the South African JET is broader than the environment, including economic and social concerns as well. Despite this, dedicated focus on environmental degradation through (renewable) energy-related activity is warranted, as it is directly linked to the wellbeing of communities and their capacity for economic activity.

As explored, paradoxically, the low-carbon energy transition does pose substantial risk for further damage to the natural environment globally and in South Africa. Examples include

through the use of green market instruments such as carbon offsetting which, for example, risks displacing emissions from one location to another, rather than reducing them overall. The poor efficacy of South African environmental protection regulatory tools such as EIAs and environmental tax standards also threaten the JET agenda as they fail to adequately capture the true environmental (and social) costs of energy related activity and therefore, fail to mitigate against further environmental injustice.

The failings of these instruments represents a critical gap for restorative justice with respect to energy-related social and environmental inequality, which South Africa's JET agenda should seek to resolve. Eskom's recent socio-economic impact study for the Komati coal power station shutdown is a positive indication that comprehensive risk identification and mitigation is possible within the South African energy sector (Eskom, 2022).

While, encouragingly, the JTF (2022) and JET IP (2022) do address sustainable land-use, the risk of further environmental degradation through renewables is not grappled with thoroughly. Therefore, the current South African JET approach to the natural environment is distinctly focussed on mitigating further damage and not on restoration.

To bridge this restorative gap with respect to renewable energy project development, Energy Financial Reserve Obligation (EFRO) may act as a valuable restorative regulatory tool. Not currently a mandate in South Africa, EFRO is increasingly being put forth globally as a safeguard against environmental degradation through energy development. EFRO obligates energy project developers to provide the financial resources for waste removal and site restoration after project closure upfront (Heffron, 2021:14). Such a mechanism – alongside the improved EIA and environmental tax design – will be meaningful instruments of restorative energy justice as it priorities the principle of long-term environmental sustainability, to support the social and economic dimensions of the South African JET.

5. Gender Equity and Social Inclusion

Dubbed as the most unequal[19] country globally (World Bank, 2022:1) mitigating further social exclusion and inequity for citizens – tenets of the JET – through renewable energy is an apt concern for South Africa. Indeed, emerging scholarship (Sovacool, 2021; McGowan and Antadze, 2023) note that despite the win-win framing, low-carbon transitions have been accompanied by extensive social cost globally. Importantly, they note that this cost has not been evenly distributed, but has been disproportionately placed on indigenous communities, ethnic minorities and the economically vulnerable (Sovacool, 2021:13).

As previously explored, ensuring meaningful social ownership of the renewable economy value chains will be vital to ensuring democratised and socially inclusive energy systems in an increasingly privatised South African renewable energy economy. As reflected by ownership requirements of the REI4P, for example, determinants of ownership should take into account socio-economic vulnerabilities to restore and enhance the wellbeing of historically marginalised groups such as people of colour and women as well as those to be dispossessed due to the phaseout of coal, such as coal mining communities. Failing this, the renewable energy transition threatens to at best, maintain South Africa's highly unequal socio-economic profile or at worst, exacerbate inequalities by entrenching the power of the historically privileged, the political elite and the private sector.

While the recurrence of LCRs and social ownership across South African renewable energy and just transition policies demonstrates a progressive commitment to social change through renewables, such requirements in the case of the REI4P have had lacklustre outcomes with

[19] Based on income distribution across the population (Gini co-efficient)

consistently higher levels of foreign and non-BEE ownership and limited decision-making power for community owners (Overy, 2019:17). Mention of 'trade-offs' is ubiquitous across just transition discourse (including policies such as the Integrated Energy Plan, draft SAREM and the JET IP) demonstrating the perceived incompatibility between developing local industrial capacity and fostering global competitiveness through cheap input materials.

Furthermore, the highly politicised nature of South Africa's energy sector and persistent governance challenges also exposes the renewable transition to mismanagement and rent-seeking by political elite. This may result in a successfully decarbonised South African energy sector, however, with little socio-economic trickle down for citizens due. The cost of the transition would therefore be disproportionately placed on the economically vulnerable, given the worsening unemployment crisis and the dire need to ensure a just labour transition for South African coal and fossil fuel sector related workers.

As discussed, the South African JET also provides the opportunity to reconfigure inequitable gender dynamics through ensuring more women are suitably skilled (or reskilled) but also that patriarchal occupational norms are challenged, to allow the increased participation of the renewable energy economy. Instruments such as LCR's and social ownership requirements will therefore be critical in enforcing restorative energy justice through the transition, particularly if their efficacy is improved.

More broadly, there is little evidence to suggest that South Africa's market-led renewable energy transition (as envisaged by the state) will lead to substantial, structural socio-economic change. 'Green capitalism' mechanisms (to be adopted increasingly to incentivise the transition to renewables) are limited in their ability to deliver increased socio-economic inclusion and

ecological restoration, due to capitalism's inextricable role in the current ecological crisis and the economic marginalisation of Global South countries and citizens. Ultimately, it is likely that without significant innovation, centre (Global North) countries will continue to benefit at the expense of 'periphery' countries such as South Africa through existing relations of economic dependency, even through the renewable energy economy.

Indeed, concerns of a 'green scramble for Africa' or green neo-colonialism are emerging across North Africa and the SSA region in light of the numerous green deals (such as the South African JETP) with European powers. The JET IP (2022) which grapples with the investment of USD 8.5 billion by the JETP, envisions South Africa as a world-leading exporter of green hydrogen to foreign markets such as Germany, France and the United Kingdom (JET IP, 2022:12). While the opportunity to boost economic growth through exports is undeniable, there is the risk that SSA countries such as South Africa will become solely a means for Europe to meet its decarbonised energy demands to further its own development – emulating colonial North-South relationships of extraction (Showers, 2014:304).

The risk of (further) exclusion is therefore pertinent for conceptualising the renewable energy transition in South Africa, as the transition may result in limited socio-economic trickle down for citizens and colonial continuities of natural resource exploitation, dispossession of communities, environmental damage and entrenchment of corrupt political elites. Once again, improving the efficacy of restorative tools such as LCR's and social ownership requirements will make a significant contribution in mitigating the entrenchment of such inequalities.

6. Cross Scalar Justice

As the name suggests, the third principle of restorative energy justice (cross scalar justice) cuts across the four discussed dimensions within this paper (the market, public, political, social and environmental). Broadly, cross scalar justice refers to the need to consider and mitigate injustice at all scales (levels) of the energy life cycle. The inadequate focus on justice throughout the energy life cycle (i.e., up, mid and downstream) is a key criticism of energy (and climate) policy design by energy justice scholarship to date.

Therefore, energy justice scholarship increasingly points to the need consider broader scalar justice implications given the intersectional nature of energy and the interactions between technology, policy, politics, markets, society and culture (Sovacool et. Al, 2017:678; Geels, 2011:25; Gulmez, 2017:2). Within the South African context, cross scalar energy justice for the JET would mean consideration of: local communities economically, environmentally or politically through energy production-related activities (upstream); local, social and gender equitable ownership of renewable energy value-chains (midstream); and environmental or social impacts of carbon emissions through energy distribution and consumption (downstream).

To date, South Africa's energy planning has been dominantly distributive and, therefore, downstream in focus, focussed on ensuring equitable access to electricity for citizens. As evidenced through the previous discussion, however, decarbonisation in South Africa poses significant cross scalar risks such as exacerbating the already dire unemployment crisis and threatening the livelihoods of coal-dependent local economies such as in the Mpumalanga province. Importantly, this consideration for injustice is also present in other mining sectors critical for the renewable energy transition such as platinum, where private employers are known to provide notably low wages, unsafe working conditions and inadequate housing infrastructure for workers (Pelders and Nelson, 2019:277).

Given the working definition put forth within this study for the South African JET which focuses on redressing disenfranchised demographics, achieving a legitimate JET for South Africa will constitute not only reducing carbon emissions and improving access to electricity (downstream justice) but also improving/restoring the 'upstream' conditions for communities affected.

Chapter 5: Conclusion

5.1. Summary of Findings and Recommendations

This paper has provided a critical review of the state of the South African JET with the objectives to:

1. critically consider the market, social/environmental and public/political conditions necessary to foster a truly inclusive JET in South Africa;
2. explore and make a case for the contribution of restorative energy justice in improving environmental sustainability efforts, gender equity and social inclusion (GESI), the delivery of cross scalar energy justice and more broadly, inequality in South Africa's renewable energy political economy;
3. contribute methodologically and substantively to emerging JET scholarship pertaining to the relatively under-explored SSA region and to deepen the scope of knowledge with regards to the political economy of renewable energy in South Africa.

Undeniably, South Africa's energy political economy is at a critical juncture, undergoing substantial change both in its conceptualisation of the role of the state given the proliferation of renewable energy and in its articulation of socio-economic and environmental commitments. Both globally and in comparison to the broader SSA region, South Africa is advanced in its

national dialogue on the JET, evidenced through policy documents such as the JTF (2022) and JET IP (2022), commitment to inter-governmental agreements such as the JET Partnership and the establishment of Eskom's JET Office. The multi-faceted nature of the JET means that its achievement will require cross-sectoral and cross-scale collaboration throughout the South African energy political economy.

This multi-faceted nature is reflected in the wide range of challenges discussed, including: worsening energy insecurity in the form of loadshedding; a highly politicised bureaucracy with competing vested interests and Eskom's strategic post-Apartheid role; a no longer 'fit-for-purpose' institutional environment marred by non-linear policy processes; renewable energy market mechanisms with limited capacity for socio-economic transformation/inclusion; the dire state of electricity transmission and distribution infrastructure and capacity constraints of municipalities and; an untenable unemployment crisis and the threat of further job losses due to decarbonisation. A commonality across these challenges and dimensions is the potential exacerbation of inequality for the country's historically marginalised and most vulnerable communities through the JET.

To date, distributive energy justice – securing equitable energy access for citizens – has been at the forefront of South Africa's approach to energy planning. This is warranted given the unequal infrastructural development due to its Apartheid history and the country's persistent and dire electricity supply challenges. It is evident that this focus will, however, be insufficient to deliver a cross-scalar JET in South Africa, signalling the need for other forms of justice to be adequately conceptualised. It is evident that a narrow focus on distributive justice and procedural justice is no longer fit-for-purpose and that, going forward, South Africa's JET efforts must be restorative in nature due to redress entrenched socio-economic inequalities. Restorative energy justice is important as it addresses systemic inequalities in the energy sector, in contrast to the retributive or corrective approaches of distributive and procedural justice.

As put forth, within the South African context the JET can be understood as distinctively restorative as it aims to foster environmental sustainability, gender and social inclusion and cross-scalar justice with a particular focus on redressing disenfranchised demographics. This is reflected in the working definition of South African JET created in this study, which aims for: the transition from a fossil-fuel based energy system towards a low-carbon system, which fosters environmental sustainability, gender and social inclusion and cross-scalar justice with a particular focus on redressing disenfranchised demographics

Therefore, this paper has argued that given the country's highly unequal socio-economic context, restorative justice in particular will be critical for boosting the country's capability to enable a JET, namely by offering a valuable conceptual bridge between energy justice discourse and just energy transition practice.

Given the objectives of this research, key recommendations made within the paper include:

1. The adoption of a working definition of the JET by relevant bodies such as the PCC, which acknowledges restorative justice as paramount;
2. LCRs and social ownership requirements thresholds embedded in energy policy which balance market forces and long-term inclusion of local and vulnerable demographics in the South African renewables economy;
3. Enhanced mechanisms for community engagement, participation and decision-making to ensure LCR and social ownership requirements are meaningful and provide opportunities for technology and skills transfer, especially for women and youth.
4. Improved efficacy for environmental/social impact assessments and environmental tax to adequately capture the true environmental and social costs of energy related activity. This may include restorative instruments such as EFRO to obligate energy project

developers to provide the financial resources for waste removal and site restoration after project closure upfront.

Encouragingly, the inclusion of restorative justice (as opposed to liberal justice theory's traditional third tenet of recognitional justice) by the recent JTF (2022) and JET IP (2022) signal that South African policymakers are aware of its potential contribution to the JET agenda. Although ambitious, supported by innovative restorative justice-centred policy and regulatory mechanisms, South Africa does have a JET within grasp.

5.2. Limitations and Implications for Future Study

A key limitation of this study has been its narrow focus on the South African context. South Africa's distinct political history, existing renewable energy economy, well-developed JET national dialogue and energy security challenges have resulted in the specialised treatment of the JET, not extendable to the broader Southern African or SSA region. In addition to this, existing just energy transition discourse (in both scholarship and practice) is rooted in Western liberal jurisprudence and is therefore dominantly engaged with Global North social, economic and environmental systems, despite stressing the importance of an anthropocentric approach to further justice in energy systems (Sovacool et al. 2017:678). Therefore, there exists a considerable gap within energy justice scholarship to consider justice in the varied and unique contexts of the Global South.

An implication of this study is, therefore, contribution to the under-explored field of SSA-focussed energy justice research. Further exploration of how renewable energy transitions can redress inequality across the varying political systems, natural endowments and demographic profiles of SSA countries would be valuable for future study. In addition to increased focus on Global South countries, the state of knowledge on restorative energy justice globally stands to

be improved through future study to adequately grapple with not only *what* emerging renewable energy technologies and practises are, but importantly, *how* they interact with existing systems and support or inhibit a truly just, energy transition.

Lastly, the cross-sectoral nature of the JET has presented both a limitation in this research as well as an opportunity for further study. This paper undertook analysis of three perspectives of the just energy transition (market, social/environmental and public/political) resulting in a broad scope of themes and findings. Although the JET necessitates an integrated approach, narrower and more detailed treatment of each perspective may allow for enhanced insights, and an increased number of recommendations and practical implications.

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