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Gender inclusivity towards a just energy transition in South Africa

Valerie Geen

9105965Y

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

Wits Business School

University of the Witwatersrand

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Supervisor: Dr Jenika Gobind

ABSTRACT

To avoid the escalating impacts of climate change, governments have increasingly committed to a net zero decarbonisation trajectory by 2050. As a country which is the largest carbon emitter in Africa due to its high fossil fuel dependence, South Africa committed to a just energy transition at the Conference of the Parties (COP 26) in 2021. This commitment was conditional on pledges being honoured by international partners to support South Africa in capacity building, technology and finance. Premised on the intention for the energy transition to be just and inclusive, this study investigated how gender inclusivity could be advanced. Based on the theoretical framework of energy justice theory, this study used the lens of the adapted engendered energy justice conceptual framework to inform its qualitative study of South Africa's just energy transition to clean energy. The qualitative study interviewed a selected sample of 11 key informant interviewees (KII) and examined the barriers to gender inclusion. The findings confirm that the Just energy transition is underway and has accelerated recently. While it potentially may offer more opportunities for women, there is a need to introduce gender mainstreaming and the integration of broader energy justice principles into the transition. The development of a long-term energy vision and strategy is recommended. Finally, the study proposes that the energy strategy and gender mainstreaming should be part of a national dialogue.

Key Words

clean energy; energy justice; gender equality; gender inclusivity; gender mainstreaming; just energy transition

DECLARATION

I, Valerie Geen, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in Energy Leadership at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Name: Valerie Geen Signature: 

Signed at Johannesburg

On the 27 day of June 2025

DEDICATION

I dedicate this work to my dear husband, Andre. You've always given me wings to fly, believed and supported me to be more than I thought I could be. Thank you.

To my beautiful girls, Donata and Alex, I hope this work of love will bear fruit for you as young women. I'm proud of you both and want you to own your self-worth.

To my sister-cousin Colette, thank you for all your motivation, the long conversations, the breaking of bread, shooting the breeze - always pushing me gently towards the finish line. Here's to you.

To all my sisterhood with whom I've travelled down hills and valleys- the laughter and the tears – Thanks to you all – Jennifer, Coletane, Christel and Christelle. You are all women of courage and strength, and you've all raised me up. I thank you.

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To Prof Jane Spowart – a special lady, running the last mile with me when the pressure was too much. You made a difference.

To all the people who gave of their time so graciously to help me with this special project – not just a degree but giving me a key to unlock the door for others. I appreciate you all.

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LIST OF ACROYNMS AND ABBREVIATIONS

CBA	Carbon Border Adjustment
COP	Conference of the Parties
GBV	Gender-Based Violence
GDP	Gross Domestic Product
GHG	Greenhouse Gas
JET	Just Energy Transition
JET-IP	Just Energy Transition Implementation Plan
JT	Just Transition
KII	Key Informant Interviewee
NDC	Nationally Determined Contributions
NDP	National Development Plan
NEDLAC	National Economic Development and Labour Council
PCC	Presidential Climate Commission
REIPPP	Renewable Energy Independent Power Producer's Programme
SDGs	Sustainable Development Goals
TA	Thematic Analysis

1. INTRODUCTION

1.1. Purpose of the study

Based on the application of the energy justice theory framework and the adapted engendered energy justice conceptual framework, this qualitative study examined how gender inclusivity could be advanced to ensure South Africa's just transition to clean energy. "No one should be left behind" (PCC, 2022) in the just transition. This required exploring the extent to which gender was given focus in the just transition process. Specific reference was made to the inclusivity of women as participants and beneficiaries of the just energy transition in South Africa.

1.2. Context of the study

The just transition to clean energy in South Africa is a defining moment for the future of the country as it seeks to respond to climate change while ensuring that the transition will be inclusive in its social, economic and environmental processes and outcomes. This transition is no easy task given the dominance of what is referred to as the "Minerals and Energy Complex" (Swilling et al., 2015, p. 11). This complex has supported a socio-political regime that undermined justice and development and contributed to environmental degradation and welfarism.

The Climate Change Act, gazetted on 23 July 2024 (Presidency, 2024), committed South Africa to the "global effort of reducing greenhouse gas (GHG) emissions" (Sovacool et al., 2021) and adopting measures to build adaptive capacity and resilience against the impacts of climate change. This response was underscored by the need to address various sustainable development goals that are equitable, developmental, transformative, and will benefit present and future generations.

The South African government committed to a "whole economy approach" (Abram et al., 2020, .p 3) by locating the co-ordination, leadership and governance of climate change under the Presidency. It pledged to assume its "fair share" of common but differentiated responsibility (Carley & Konisky, 2020,

p. 569), and to restrict global temperatures below 2º Celsius (PCC, 2021). This was conditional on receiving international support through finance, technology and capacity-building (DFFE, 2021).

Such conditions were premised on South Africa being a developing country with many competing challenges. Recent climate impacts on critical infrastructure have already illustrated the country's vulnerability to changing weather patterns on its social, economic and environmental well-being (DFFE, 2021). These disasters exacerbate historical and existing challenges of poverty, unemployment, inequality and the inability to adequately address basic services. The latest Sustainable Development (SDG) report (Sachs J.D, et al, 2024), placed South Africa at 114 out of 164 countries in achieving the 2030 targets, exemplifying its serious shortcomings in virtually all the SDGs.

It is against this backdrop of competing priorities that South Africa, as a signatory to the Paris Agreement (UNFCCC, 2015), must transition from a carbon-intensive economy to a low carbon economy, according to its Nationally Determined Contributions (NDCs) (DFFE, 2021).

The transition from fossil fuels cannot happen without a carefully managed transition process. Increasingly "there is focus on the rights and obligations of all stakeholders" (Heffron, 2022, p. 1). The just transition (JT) framework (PPC, 2022) is a multistakeholder response under the helm of the Presidential Climate Committee (PCC, 2022). The JT framework is clear that the transition process should be just and leave no one behind. While this implies a process of inclusion of both the affected communities transitioning from fossil fuels and the eventual adoption of clean energy across the economy, the plan has yet to give attention to gender inclusivity among other sectors of society.

While South Africa's pronouncements towards gender equality and inclusivity are not new (Commission, 2011), the continued underrepresentation of women in key economic sectors of South Africa, including the energy sector, perpetuates the possibility of an unjust transition (Stats SA, 2022). In South Africa, women constitute 51,5% of the total population of 62 million, while 48,5% are men. Over

10 million of these women also classify as youth, i.e. 15-35 years old (Stats SA, 2022).

While the National Development Plan committed to the inclusion and economic empowerment of women (Commission, 2011, p. 43), reference to women in several government policy documents, does not indicate specific strategies and plans that translate the promise made by the NDP 2030. Rather, women are categorised as vulnerable in the nomenclature of “the poor, youth, women, people with disabilities” (Presidency, 2023, p. 15). With this classification, there is underestimated recognition of the “potential role of women as agents of change, either as energy entrepreneurs, or as decision-makers in energy policy, or as employees in the energy sector” (Union, 2019, pp. 32-33).

This study, therefore, explored why and how the focus of gender inclusivity needed to be given particular focus in the Just Energy Transition (JET) and the strategic priority of “inclusive growth and job creation”.

1.3. Research problem

Inherent in the transition of the energy sector in South Africa is the historically unequal participation and inclusion of women due to this sector being traditionally dominated by men, as well as other barriers that women face in terms of inequality, exclusion and societal norms. The relatively low participation of women in the existing energy sector places them outside of the network of access to information, skills and resources in transitioning to clean energy. According to (Jenkins et al.,2016, p. 178), three mechanisms of inclusion include “the sourcing of local knowledge, sharing of information and ensuring strong institutional representation”. Regardless of whether women are currently in or outside the energy system, there is no distinct platform for their voices to be heard in policymaking. The current multistakeholder platform for policy input is processed through the National Economic Development and Labour Council (NEDLAC) which is dominated by big business and labour.

If the status quo remains, decarbonisation of the economy could leave women behind in the mainstream adoption of clean/sustainable energy. Gender mainstreaming provides a vehicle to influence policies and programmes to

ensure that issues concerning men and women are given equal attention. This would result in women receiving an equitable share of resources (Clancy et al., 2020). However, evidence of gender mainstreaming is absent in most policies and procedures.

Recent energy justice theory which has emerged on the back of environmental and climate justice, has converged on the view that energy has been conceived predominantly through a technological and economic lens. The disciplines of technology and economics (Sovacool et al., 2015) and participation in decision-making are dominated by men and their perspectives. Energy justice theory argues for a multidisciplinary approach that includes social science among other disciplines and is premised on procedural, redistribution, recognition, restorative and cosmopolitan justice principles (Sovacool et al., 2015). Energy justice theory argues for an inclusive human-centred approach that recognises all members of society. This study focused on gender inclusivity since women represent a significant demographic of South African society (Stats SA, 2022).

South Africa's carbon emissions are primarily based on energy production, consumption and associated energy intensity. The transition to clean energy is likely to lead to a major shift in the economy with the potential for many job losses but also the possibility of new opportunities. It is, therefore, important for women who already face inequality of access to economic participation to have the opportunity to be fairly treated in the energy transition. According to the latest World Economic Forum Gender Equality Index, women in South Africa achieved a low score of 0.65 in the category of access to economic participation and opportunity (Forum, 2024). Ultimately, a just energy transition is "a fair and equitable process of moving towards a post-carbon society. This process must seek fairness and equity with regard to the major global justice concerns, such as (but not limited to) ethnicity, income, gender within both developed and developing contexts" (McCauley et al., 2018, p. 2).

This study, therefore, investigated how the energy transition could advance gender inclusivity in South Africa in a manner that is just and promotes equal

decision-making, participation and benefits for women. It also examined the barriers to gender inclusivity in South Africa's transition to clean energy.

1.4. Research objectives of this study

The study objectives were to:

- Explore South Africa's transition to clean energy within the framework of just transition
- Investigate the concept of gender inclusivity in South Africa's just transition to clean energy.
- Identify and examine the barriers to achieving gender inclusivity in South Africa's clean energy transition

1.5. Significance of the study

This study is significant in that it is likely that the transition to clean energy will have societal impacts which could have both positive and negative impacts on South African citizens. "Everyone has the right to administrative action that is lawful, reasonable and procedurally fair". Constitution of South Africa (1996). Bill of Rights, Section 33. This study examines whether women will be impacted in a procedurally just manner in the transition to clean energy.

In addition, much of the principles and processes which are being adopted internationally in the undertaking of a just transition to addressing environmental challenges and opportunities are drawn from the ILO's guiding principles (ILO, 2015,). These include social dialogue and consensus to inform institutional policy making and implementation at all levels, informed and ongoing consultation with all relevant stakeholders, promotion of rights of workers and social protection, while also taking cognisance of gender dimensions with specific gender policies to promote equitable outcomes.

Furthermore, this study has applied energy justice theory as an emerging theory informed by debate among leading scholars in the field of energy justice, since it is well placed to serve the transition which has built greater momentum. The relevance for the Global South is that more work needs to be done that includes

contributions to this body of knowledge from scholars in the Global South. This study sought to apply this theory to policy and practice in South Africa, given the integrated and reciprocal nature of regional and global energy systems.

This study also intended to illustrate the value/efficacy of the additional framing that energy justice theory lent to the just energy transition debate and implementation. A particular focus was on how such framing could promote more just and equitable outcomes for women in policy and practice. A similar approach could be extended to sectors of society that might be marginalised in the process of change and are transitioning into the broader economy.

1.6. Delimitations of the study

This study focused on the just transition of energy in South Africa and therefore, focused on plans and processes unfolding with the adoption of clean energy. Clean energy includes renewable energy and energy efficiency, in essence, the use of energy which contributes to a low-carbon economy. While transition affects various sectors of society including those marginalised, this study explored the just transition through a gender lens to consider the role, participation and impact on women in South Africa. It also drew on broad gender concepts, such as gender equality and gender mainstreaming rather than a particular gender or feminist theory.

1.7. Definition of terms

Term	Definition
Energy security	**Security of supply and production, availability, pricing safeguarding of local production capacity (Jenkins et al., 2016).**
Energy justice	‘‘Energy justice’’ is a global energy system that fairly disseminates both the benefits and costs of energy services, and one that has representative and impartial energy decision-making (Sovacool et al., 2015, .p 436).
Gender	A social and cultural construct which distinguishes differences in the attributes of men and women, girls and boys, and accordingly refers to the roles and responsibilities of men and women (Unicef, 2018)
Gender neutral	Anything – a concept, an entity, a style of language – associated with either the male or female gender. The nature of systemic, embedded or internalised bias is unfortunately often perceived to be gender neutral but is gender blind (Unicef, 2018).
Gender mainstreaming	Gender mainstreaming assesses the implications for girls and boys, men and women of any planned action, including legislation, policies and programmes (Unicef, 2018).
Just Energy Transition	Achieving a “Just Energy Transition” is central to the work of the Presidential Climate Commission, ensuring that the lives and communities that are tied to high-emitting energy industries (e.g., coal) are not left behind in the shift towards a low emissions economy. Indeed, the energy transition must be fair and perceived to be fair. (PPC, 2022)
Nationally determined contributions	These are commitments that countries make to reduce their greenhouse gas emissions as part of mitigating climate change. These commitments include the necessary policies and measures for achieving the global targets set out in the Paris Agreement to reduce national emissions and adapt to the impacts of climate change. (UNFCCC, 2015)
Sex disaggregated data	Data that is cross classified by sex, presenting information separately for men and women, boys and girls. When data is not disaggregated by sex, it is more difficult to identify real and potential inequalities (Unicef, 2018)

1.8. Assumptions

The following assumptions were considered in this study:

- The transition to clean energy in South Africa might lead to unfair and unequal outcomes for some sectors of society
- Because of the significant reliance on coal and the resources required to transition to clean energy, ensuring a just process will be challenging
- The extent to which the transition to clean energy has identified and plans to address the barriers to gender inclusivity is unclear

1.9. Structure of the report

Chapter 1 presents the overarching purpose and scope of the study, describes the context, and problem statement and introduces key concepts and frameworks which underpin the study.

Chapter 2 is the literature review which unpacked the energy justice theoretical framework and adapted it to a conceptual framework to address the topic of engendering just energy transition in South Africa.

Chapter 3 describes and discusses the research methodology chosen for the study.

Chapter 4 presents the key findings of the study.

Chapter 5 analyses and discusses the findings and efficacy of the research methodology.

Chapter 6 offers recommendations, limitations and conclusions drawn from the study.

2. LITERATURE REVIEW

2.1. Introduction

This chapter reviews the emergence and development of the energy justice theory. The aim was to explore its key tenets, concepts, and frameworks, and explore its relevance for South Africa's just transition to clean energy. Based on this critical review, the study presents an adapted or engendered conceptual framework to apply to advancing gender inclusivity. Finally, it identifies the barriers to be resolved to ensure a truly just energy transition in South Africa.

2.2. South Africa's energy landscape

In the context of this study, it was important to consider the current energy landscape and the motivational factors and considerations for transition.

South Africa currently has an energy mix dominated by over 80% coal to generate electrical power. Nuclear energy contributes 4.6%, renewable energy 7.3% and a negligible 1.6% from diesel (CSIR, 2023).

The energy landscape in South Africa is unsustainable because of its current energy and carbon intensity and the impact this has on the major economic activities and economic competitiveness. This breakdown of energy consumption also serves as an example of how a just transition to clean energy would impact various economic sectors and their related value and supply chains.

2.3. Clean energy transition

South Africa is a signatory to international commitments including the 17 UN Sustainable Development Goals (SDGs) and the Paris 21 Agreement. With these commitments, South Africa is obliged to embark on decisions to transition to future clean energy and climate targets while simultaneously addressing SDGs that include environmental, economic and social goals (Heffron, 2022). "It is increasingly recognised that the transition to a post-carbon economy needs to be green, sustainable and socially inclusive, with the Paris Agreement referring to the 'imperatives of a just transition' and the EU vowing to 'leave no one behind' in its proposed Green Deal" (Abram, 2020, p. 2).

Key to South Africa's energy transition is the need to move with speed and scale to adopt clean energy.(Include NDC targets) Clean energy is predominantly classified as renewable energy; its current portion of South Africa's energy mix is 7%, (CSIR, 2023) and is a far reach from where South Africa needs to be. The classification of a clean energy system requires a minimal social and environmental impact, should not lead to natural resource depletion, must supply current and future energy demands, benefit society equitably and efficiently, have little or zero carbon emissions and should protect land, water and air. Ultimately, clean energy systems should comply with safety and not burden future generations (Dincer & Acar, 2015).

2.4. Just energy transition in South Africa

Various protests in recent decades have argued for a more integrated approach to respond to climate change that included environmental, economic, social, cultural and psychological dimensions of the transition to a post-carbon economy, The Paris Agreement was the first international treaty to include a social lens regarding the "imperatives of a just transition". These included creating decent work and quality jobs according to nationally defined development priorities alongside references to human rights, gender equality, intergenerational equity and procedural justice (Abram, 2020).

A follow-up to this treaty was the publishing of guidelines by the International Labour Organisation (ILO) to support the practical implementation of the Just Transition Framework (ILO, 2015). The ILO offered the following definition, "A just transition means promoting a green economy in a way that is as fair and inclusive as possible to everyone concerned – workers, enterprises and communities – by creating decent work opportunities and leaving no one behind. A just transition involves maximizing the social and economic opportunities of climate and environmental action, while minimizing and carefully managing any challenges, including effective social dialogue and stakeholder engagement and respect for the fundamental principles and rights at work" (ILO, 2023, p. 29).

Under the leadership of the Presidential Commission on Climate Change (PCC), South Africa drew from the ILO in defining a just transition and its accompanying framework, implementation plan and investment plan (PCC, 2022).

The JT framework and JET plan, in keeping with the various definitions of a just transition, make numerous references to the inclusion of gender dimensions and the participation of women but does not go far enough in adopting a gender mainstreaming approach to the transition. Their stakeholder engagements have reached out to various stakeholder groups, including government, the private sector, faith-based organisations, civil society, NGOs, communities and labour. However, there has been limited recognition of women as a significant proportion of the population many of whom are likely to be left behind for as long as there is no focused attempt to be intentionally gender inclusive and take gender considerations into account. (PCC,2022)

Both the energy justice frameworks and the plans for a just energy transition in South Africa are underpinned by principles of social justice to transition to a low-carbon economy while simultaneously responding to a developmental agenda. It was, therefore, the intention of this study to identify and examine how to advance gender inclusivity. This was especially true in the context of South Africa where women comprise over 50% of the population (Stats SA, 2022) and have traditionally been poorly represented in the broader economy and the energy sector.

2.5. Background on energy justice theory

Energy justice is a relatively new and emerging theory, building on the foundations of climate justice and environmental justice (McCauley, 2013). It was driven by notions from the 1970s that people needed to be treated fairly by environmental laws and policies, regardless of their diversity. Having alluded to the influence of environmental and climate justice, it must be said that while energy justice builds on the foundations of the comprehensive work of Schlosberg on environmental justice (Schlosberg & Collins, 2014), there are several debates about the distinctions and variations of this background carried through by energy justice (Jenkins, 2018; Woods 2023). Energy justice can also be traced to the

1980s, most notably to the Brundtland Commission Report, published in 1987; this was rooted in principles of social justice and the concept of sustainable development for the benefit of present and future generations (Jenkins et al., 2017). From 2013, energy justice began gaining traction and expanding on concepts, principles and frameworks and needed an ethical approach to energy policy and practice (Heffron et al., 2017).

A seminal author on energy justice, (McCauley 2013), challenged other researchers to pay attention to justice-based concerns across energy systems, from production to consumption. Other notable scholars began contributing to debates on the energy trilemma which articulated the need for balancing the political, economic and environmental demands on energy (Heffron et al., 2015).

Another seminal contribution to the growing theoretical framework on energy justice appeared in Nature Journal, where the argument suggested was that "energy policy and technology discussions are limited to the domains of engineering and economics" (Sovacool et al., 2016, p. 5). Furthermore, it was argued that "energy and climate issues were often framed without a moral compass, and it proposed the need for an energy justice framework that focused on principles of availability, affordability, due process, transparency and accountability, sustainability, responsibility and intragenerational and intergenerational equity, which highlighted the futurity, fairness and equity dimensions of energy production and use" (See Figure 2.1).

Energy justice advocates for a multidisciplinary and interdisciplinary approach. The argument is for the introduction of a social science and systemic lens with which to consider energy systems (Jenkins et al., 2016). In addition, it seeks to apply justice principles to energy policy, energy production systems, energy consumption, energy security and energy activism. Perspectives and insights from other disciplines, such as business, geography, political science, legal studies, philosophy and environmental studies are included. This study extended the focus of energy justice to include a gender lens.

Scholars, such as (Sovacool et al., 2014), have argued for a more people-centred approach that recognises energy as a valued resource. Therefore, benefits and

burdens or harms must be considered fairly and equitably distributed throughout the life cycle of production, distribution and consumption. Further, scholars argued that energy injustice equated to an abuse of human rights which impacted people's daily lives. Increasingly, scholars called for research and practice in the energy sector that would contribute to decision-making in restoring equality in society (Heffron et al., 2017).

Drawing from the literature, energy justice can be defined as an approach to energy that is based on the core tenets of distribution, procedural and recognition justice (Heffron et al., 2017) which is applied across the energy system and the energy life cycle (Heffron et al., 2014). It is also based on Sovacool's eight principles as mentioned already (Sovacool et al., 2016).

2.6. Tenets of the energy justice theoretical framework

This section explains and discusses the relevance of the various tenets of energy justice, and why and how they are considered in a just energy transition that advances the inclusivity of women.

2.6.1. Distributive justice

The principle of distributive justice is whether the benefits and challenges of energy are evenly shared or distributed in terms of the location of energy infrastructure, accessibility to transmission and distribution networks and the costs of supply (Jenkins et al., 2016). It could further include where production facilities are located relative to communities and whether such locations are harmful to the health and well-being of those communities. Examples of distributive injustice include disparate access to modern energy, which in turn might impact health, education, and access to economic opportunities (Sovacool et al., 2016).

2.6.2. Procedural justice

In the energy system, all sectors of society or a locality should be able to participate meaningfully in decisions that are taken seriously and treated with impartiality and sincere engagement. It should be based on complete information and full disclosure by government and business leaders (McCauley, 2013). Procedural justice should raise questions about process, fairness, and

transparency in decision-making, and relevant stakeholders should be given recognition and an invitation to participate in consultations (Sovacool et al., 2016). Stakeholders should have an irrefutable stake in taking decisions or offer avenues for recourse or redress where due process is not followed, or rights are violated.

2.6.3. Recognition justice

Recognition justice is underpinned by the need to recognise different groups and most notably, local communities (Jenkins et al., 2016). People should be treated with respect regardless of social, cultural, gender or racial backgrounds. At the same time, this implies that stakeholders should not be degraded, insulted or politically intimidated because of their diverse perspectives (McCauley, 2013). Recognition justice also assists in identifying which stakeholders are misrepresented or even ignored (Jenkins et al., 2016).

2.6.4. Restorative justice

Beyond the three core tenets of distributive, procedural and recognition justice, restorative justice is considered an underpinning form of justice that can be applied across the various phases of an energy life cycle, system or activity (Heffron et al., 2017). Historically, there are many examples of injustices suffered through oil spills, impacts on air quality or human health where the need for restorative justice would apply. Often the restorative costs are prohibitive (Heffron et al., 2017) and consequently need to be factored into decision-making, even to the point of determining whether or not to proceed with an energy project.

Any injustice caused by the energy sector should be rectified. Decommissioning practices would be a classic example of how injustices might occur once an energy infrastructure is closed down (Heffron, 2022). This is when restorative justice may be tested although it may be too late if it was not built into the project life cycle. Restorative justice seeks to address any harm that might be suffered by individuals, the environment or the broader community. If restorative justice is intentional in practice, it can assist in implementing precautionary measures to avoid harm (Heffron et al., 2017).

2.6.5. Cosmopolitan justice

In essence, cosmopolitan justice advocates that as far as energy is concerned, we are all citizens of the same world and, therefore, the cross-border effects of energy activities need to be considered (Heffron, 2022). The need for an energy transition in response to climate change requires a change of behaviours and attitudes on a global scale. Regardless of where energy is used or who uses it the most, the impact on supply chains and climate change, have illustrated how globally connected people are. “Cosmopolitan justice is defined as a collective approach to creating meaningful global change specifically in energy behaviours and attitudes” (Heffron et al., 2015).

2.7 Review of the energy justice framework

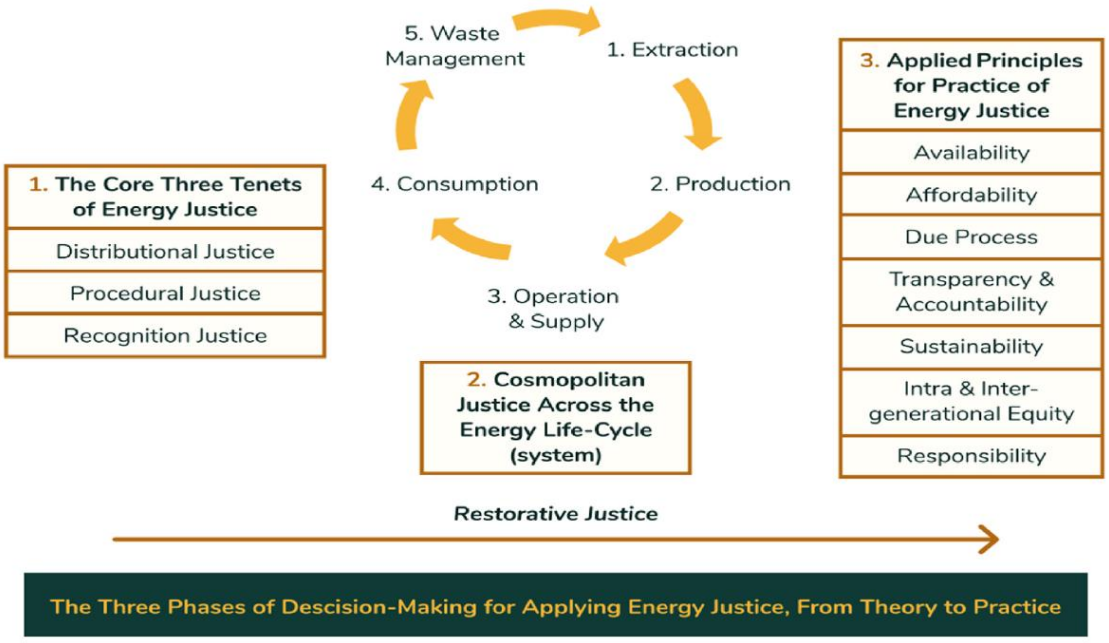


Diagram 13: Heffron and McCauley (2017).

Figure 2.1. Review of the energy justice framework

Source: Initiative for Justice (2019)

Figure 2.1. presents the phases and components of the energy justice framework. This includes the core tenets or “triumvirate” of distributional justice, procedural justice and recognition justice (McCauley, 2013), and the eight core principles of Sovacool et al. (2016). This distillation of frameworks is underpinned

by restorative justice, which together with cosmopolitan justice, provides the basis for decision-making and practice in dealing with the energy system through its life cycle of activities (Heffron et al., 2014).

The efficacy of the life cycle framework is that it facilitates the process of testing energy justice at every stage of the life cycle of the energy system. It allows a conjoining of social science with natural science as it examines energy justice from resource extraction at the beginning, to waste management at the end. It also allows decision-makers to apportion energy justice issues from a local, regional and national level. Ultimately, an aggregation of energy justice applications against each stage of the energy life cycle also provides a global perspective of the energy system (Jenkins et al., 2017).

2.7.1. Energy justice across disciplines

It could be argued that there is a high level of complexity in combining these energy justice theoretical frameworks and applying them to energy which in and of itself is already complex. ***Figure 2.1*** highlights the need for a systems approach, as well as a multi-disciplinary and interdisciplinary method of addressing a just energy transition. To place people at the centre of energy justice, Sovacool argues emphatically for energy systems to be viewed as more than modern technologies that simply equate to beneficial hardware, such as components, containers or intricate sociotechnical systems. Rather, these technologies can also be instruments and processes of destruction (Sovacool, et al. 2016).

Numerous externalities need to be considered at the extraction phase of the life cycle of clean energy, where minerals like copper and cobalt need to be mined or lithium for batteries need to be disposed of at the waste phase of the life cycle. These could include human rights abuses, depletion or contamination of water resources or loss of biodiversity. Therefore, the transition of the energy system cannot be exclusively the domain of techno-economic models or equations, and pathways to the Gross Domestic Product (GDP). (Sovacool et al. 2016, p 5) maintain that energy systems are also about “political power, social cohesion, moral concerns over equity, due process and justice”. Energy systems, therefore,

need to be reframed to navigate the divide between energy and climate goals and the development agenda in a way that is just, fair and responsive to populations that are often denied recognition (Sovacool et al., 2016).

2.7.2. Interdependencies between the core tenets of energy justice

In reviewing the interdependencies between the three core tenets, several variations should be considered. If a grouping of people is not recognised as necessary or eligible to contribute to or participate in a decision-making process or share their perspectives on a policy or activity within the energy lifecycle of activities, this can lead to a procedurally unfair process. This in turn can lead to unfair distribution of benefits or harm. (Wood, 2023, p. 3) refers to "malrecognition" when certain people can be rendered invisible, disrespected or dismissed in contributing to policies aimed at correcting "maldistributions" of resources or benefits. If people are already subject to "maldistribution", they may lack the resources to engage in procedural platforms. Another example of "malrecognition" which will be discussed in greater depth later in this paper, is the oblivion of seeing women as a grouping in terms of their gender role. They need to be included in participation and decision-making roles, to acquire opportunities, to be informed and to understand the benefits and harm associated with the transition. Women are already victims of "malrecognition" by not being equally represented in the conventional energy sector. Therefore, decisions and policies culminate in being gender-neutral or gender-blind. Women may be excluded from participating in decision-making meetings due to lack of transport, money, computer access, data for virtual meetings or language barriers.

Restorative justice as depicted in ***Figure 2.1***, underpins all the phases of the energy justice framework. If applied with rigour, energy justice considerations could assess the true cost of energy infrastructure or activities. (Heffron et al., 2022) suggest mechanisms that can be used to support energy justice include: environmental impact assessments and the post-acceptance monitoring phase; (ii) a social-license-to-operate that will ensure the development of cooperation with the local community over the lifespan of the energy infrastructure; and (iii) the energy financial reserve obligation where the company needs to demonstrate

their financial capacity to clean and restore energy infrastructure at the end of its lifespan" (Heffron et al., 2017, p. 661).

The effectiveness of ensuring a just energy process as outlined thus far, requires political will, multidisciplinary and interdisciplinary decision-making and a systemic approach. With many competing needs to be met, there is no doubt that trade-offs will need to be considered. Hence, a further theoretical framework provided through the energy justice framework is the set of principles proposed by (Sovacool et al. 2016).

2.7.3. From principles to practice

The additional theoretical framework through which energy justice can be assessed comprises the following set of eight principles.(Sovacool et al, 2015) These include:

2.7.3.1. *Availability*: While availability is about the stock and mix of energy that is fairly distributed across a society, it is also about how the energy system works in terms of investment, available and suitable technologies, maintenance of infrastructure, reliability and sufficiency and a functional value chain from production, transportation, conservation, storage to distribution.

2.7.3.2. *Affordability:* The cost of energy and associated costs require stable and reasonable pricing that makes it affordable to everyone. In a transition to clean energy, if the investment in new technology leads to unaffordable prices, users are likely to continue to use fossil fuels if more affordable or resort to illegal practices to access modern or sustainable energy sources.

2.7.3.3*. Due process:* It is argued that stakeholder participation in the energy policy or decision-making process should "at least roughly match the importance and irrevocability of any decisions that may be reached" (Sovacool et al., 2015, p. 439). This begs the question of how such levels of importance are determined, who is recognised as part of decision-making, who enjoys the benefits of such participation and who might suffer harm? If an energy system includes extraction or production processes in marginalised communities, how much does that community's engagement and consent matter against the developer or producer? Is the cost of energy assessed, excluding the cost of externalities being

considered, such as impacts on the environment, health and other sectors of the economy? Finally, is there recourse for those excluded from the process of decision-making?

2.7.3.4*. Good governance:* Equal access to information and transparency throughout various processes of the energy system, as well as democratic processes, are required to ensure that all relevant voices are heard, and benefits or harm are shared equitably.

2.7.3.5*. Sustainability:* Sustainability requires resources to be used efficiently and conservatively so as not to deplete these for the next generation. On the one hand, this speaks to sustainable production and consumption. On the other hand, it also raises the question of whether any sector of society should be deprived of access to current energy resources to preserve energy for the future.

2.7.3.6*. Intergenerational equity:* This principle connects to sustainability by considering distribution justice not just for the present but across generations. It requires a thoughtful and unselfish approach to the production and consumption processes within the energy system.

2.7.3.7*. Intragenerational equity:* Reverting to present energy consumption, this principle is concerned with equal access and distribution of energy across current generations and according to agreed distributive determinations, such as need, merit and access to clean air.

2.7.3.8*. Responsibility:* Energy justice in respect of this principle, links to how the energy system is responsibly managed to ensure a minimisation or eradication of negative consequences that impact ecosystems and human rights.

2.8. Advancing gender inclusivity

This section defines the various concepts of gender, identifies the gender energy nexus, and reviews the evolution and contribution of gender debates to the engendering of energy justice. It also examines how these aspects are reflected in the South African context.

2.8.1. Defining gender inclusivity

Gender is defined as “the roles, privileges, attributes and relationships between women and men that are socially constructed and not biologically determined” (Feenstra et al., 2021). In addition, they contend that gender changes over time, space and context. Therefore, when considering a just energy transition, policymakers should not adopt a blanket approach to addressing energy issues since these will vary across social, cultural, economic and political contexts.

To illustrate this point further, the JET plan identified the four sectors at risk as the coal value chain, the auto value chain, agriculture, and tourism (Presidency, 2023). Apart from the level and nature of the risk relevant to gender, such risks should be assessed according to geography, and the traditional or typical roles played by men and women in those sectors as well as the possibility for new roles. Therefore, in devising and implementing the JET, consultations and decision-making are likely to vary across locations, timeframes and contexts.

While the post-1994 democracy in South Africa has made substantive progress towards gender parity, particularly in government and through various policies and legislation (Afrobarometer, 2023), women continue to be significantly excluded from the mainstream of economic participation and opportunity with a rating of 96 out of 146 countries on this sub-index in the latest World Economic Forum Gender Gap Report (Forum, 2024). While the JT framework and JET implementation plan do refer to gender inclusivity, these policies and plans categorise women along with youth, persons with disabilities and as part of the marginalised and vulnerable. Amidst this diverse grouping, women are rendered invisible and not recognised for their unique roles in society.

Testimony of the gender disparity in the main sectors of the economy is illustrated in Figure 2.2. In 2022, men accounted for the dominant share of economic sectors implicated in the JET. Women dominated employment in private households (75,7%) and community and social services (62.3%) (Stats SA, 2022).

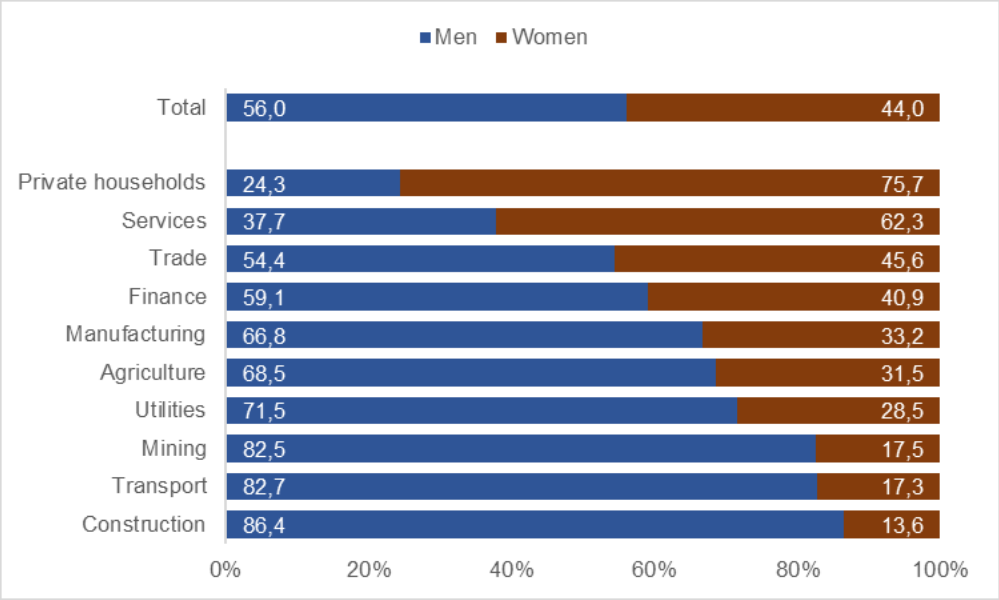


Figure 2.2: Employment shares by industry and sex, 2022 Source: STATS SA (2022, p.37)

It is accepted that there is gender inequality, however, not all women are vulnerable or marginalised as depicted in many policy documents. Consequently, this undermines the gender mainstreaming of women in the economy.

2.8.2. The gender energy nexus

In the discourse of gender and energy, there is a strong emphasis on access to energy measured through the indicators of affordability, availability and reliability which are critical to reducing poverty and supporting economic growth (Feenstra et al., 2021, p. 1). This commitment responds to SDG 7 which aims “to ensure access to affordable, reliable, sustainable and modern energy for all”. (Winther et al. 2017) report that women and men are unequally affected by limited access to energy both within society and households. Once more, it begs the question of how such gender differences are considered in the energy transition if the distinct voices of women are not represented.

Regarding the energy justice theory, limited or no access to energy would already place women at a disadvantage in procedural justice as it impacts access to information, and electronic communication and therefore, reduces opportunities for participation in decision-making. This disparity also needs to be factored into the just energy transition. Beyond access to energy, where are women located in

the system to have a voice in sharing perspectives and contributing to decision-making in terms of energy mix and affordability based on their differentiated needs? While the consultations taking place under the PCC do include outreach programmes, a significant part of their engagements take place through modern technologies and highly technical language. (PCC,2023)

As early as 1995, (Parikh, 1995) highlighted the role of women related to the energy needed beyond the household. She argued that women needed to move beyond the micro-level to the macro-level of energy policy. (Parikh, 1995) contested that beyond the household, women worked in agriculture, food processing, services and manufacturing. In addition, the time and resources for work in the household differed between genders. She further argued that women were also energy users and in some instances were part of the energy supply chain. Finally, she added that women also played diverse roles in designing, adapting and using new energy technologies. These arguments may vary in terms of geography and the various levels that women occupy in these roles, but the argument is still valid that women bring a new set of skills to the workforce and are significant in enhancing economic competitiveness (Ostry et al., 2018, p. 20).

(Allen et al. 2019) focused primarily on women's roles as leaders and decision-makers in the energy transition process. They advocated for the critical role of women's leadership in accelerating the transition from fossil fuels to a renewable energy-based future. In addition, they contributed to the applicability of the energy justice framework, through their case studies, by looking at both the demand-side and supply-side of energy systems. (Winther et al. 2017) focused on women as entrepreneurs and energy service providers and how women's involvement in the energy sector could contribute to their empowerment. Energy justice contributes to the women empowerment discourse, as it supports the notion of improving women's position in energy policy decision-making, i.e. procedural justice.

2.8.3. Engendering the just energy transition

(Feenstra et al., 2021) explain that a gender-neutral policy does not distinguish between women and men. Such policy uses general terms, such as 'households',

‘citizens’, and ‘consumers’, to identify its target group, and assumes that it equally impacts women and men. (Feenstra et al., 2021), therefore, argue that engendering policy counteracts this gender-neutral approach. In developing an engendering policy framework, they cite the seminal book by (Boserup, 1970) who recognised women’s contribution to the economy through agricultural production, the rise of feminist research following the UN conference on women, and the eventual opening of debates on the role of women in energy policy and research.

The early discourse on engendering policy included women empowerment, gender mainstreaming and social inclusion. Engendering policy was defined as “the process that creates a gender-just policy in which the needs of both women and men are addressed and universal human rights are acknowledged leading to a gender just policy impact”. In the scope of this study, this definition helps determine what a gender just policy should reflect. This definition is further based on the “gender aware” energy policy definition provided by (Clancy et al, 2004). (Clancy, 2006) elaborates the following, i) women and men have different energy dynamics in terms of their roles in the household, decision-making areas, energy needs and responses to how they cope with crises; ii) there is the possibility of access to energy technologies and services that match their respective roles; and iii) there is recognition of women’s and men’s rights in policy processes that provide an enabling environment for equal participation.

The gender aware policy definition started the gender mainstreaming discourse. In 1995, the Beijing Platform for Action was endorsed by governments, including South Africa (CGE, 2010), to achieve gender equality and the empowerment of women through gender mainstreaming of their policies (Celeski, 1995). Gender mainstreaming was defined by the United Nations in 1997 as “the process of assessing the implications for women and men of any planned action, including legislation, policies or programmes, in all areas and at all levels”. It is clear from this definition that gender mainstreaming comprises several stages, each with its own challenges for implementation. One challenge is that gender mainstreaming national policy takes time and needs political commitment and institutional support for its development and implementation (Clancy et al., 2020).

Various studies highlighted gender mainstreaming as core to analysing energy justice in terms of norms and ethics. While these studies included all tenets of energy justice, the gender dimension was framed through the lens of recognitional justice (e.g. gendered energy needs and consumption patterns based on women's role in society) or distributive justice (e.g. access to energy services). (Lieu et al. 2020) argued strongly for including gender in all energy justice principles and asserted that energy justice could be achieved only through gender justice.

There has been a growing body of knowledge on energy justice and more recently, an attempt to engender energy justice. However, (Heffron et al., 2017) highlight that little reflection is given to the energy justice frameworks and how these have translated into practice and just energy policies that resulted in equitable outcomes of energy policy interventions. Since the energy transitions are in their embryonic stages, there is still much scope for the translation of research into policy and practice.

Nevertheless, one example drawn from research undertaken by (Wiese, 2020), questions whether energy justice can apply to socially unequal or culturally diverse contexts. The findings of Wiese's research in Ethiopia illustrated that using the three tenets, context influenced the justice implications of this research. The study also found that energy concepts changed over time; therefore, energy justice concepts changed in meaning, as well as spatially, depending on their social, economic, political and cultural contexts.

Gender research has mainly focused on the gender-energy nexus based on empirical studies from the Global South while energy justice studies draw data from the Global North. Comparing these two themes provides a global appreciation of both gender inequalities and broader social injustices in energy access and use; these findings would need to be contextualised (Feenstra et al., 2021).

(Bouzarovski et al., 2017) reviewed energy justice literature and contributed further to the spatial dimension of justice, relative to the existing socio-economic and politico-legal perspectives. They argued that spatial inequalities were evident

throughout the energy system and the spread of energy poverty across geographies. Their contribution to the energy justice debate was that the spatial aspect was yet another dimension to consider the energy justice tenets in applications across private and public domains or policy and practice. They argued further, that the spatial dimension disrupted the production versus consumption positioning of the current energy poverty debate, and revealed that all three energy justice tenets had a spatial aspect (Bouzarovski & Simcock, 2017).

2.9. Barriers to gender inclusivity

In a study spanning 27 years of peer-reviewed literature on gender mainstreaming (1995–2022) following the Beijing platform, (Caywood, 2024) provided a thematic synthesis of literature which included some of the successes and challenges identified in gender mainstreaming. One key success identified in this research was the widespread acceptance of gender mainstreaming across governments, international organisations and non-governmental organisations, including success of theory to practice. Their study also listed numerous challenges for future research, some of which are integrated into the summation of the broad barriers to advancing gender participation and mainstreaming in this study.

2.10. Engendered energy justice contextual framework

2.10.1. Lack of disaggregated data

Using an energy justice lens, a common global challenge is the inadequacy of sex-disaggregated data to determine women's role in the economy and especially in the energy sector. Gender inequalities are often unapparent to policymakers due to the lack of gender-disaggregated data on energy use and energy needs (Pueyo, 2020). (Allen et al. 2019) argued that the lack of sex-disaggregated data is a key reason for the feminisation of energy poverty not receiving sufficient attention.

Apart from the need for relevant policymaking informed by disaggregated data, applying the energy justice framework can prove challenging in identifying and locating women to form part of the transition process. An interim way to address this barrier is through gender audits which can be scaled to projects or locations. (Clancy et al., 2020) supported the engendering energy policy debate by illustrating the value of gender auditing as a methodology to identify gender outcomes of energy policy. Together with the energy justice theoretical framework, gender auditing could be applied to monitoring procedural energy justice through a gender lens. While much of the gender energy nexus literature tends to confine itself to gender and household energy, there is a growing field of research on the more productive uses of energy (Pueyo, 2020). Pueyo and Maestre have also applied the gender-energy nexus perspective to small enterprises and the productive use of electricity, focusing on women entrepreneurs. Among the conclusions proffered by (Caywood, 2024) in their 25-year review research on gender mainstreaming, was the need for more inclusive and structured research into some of the key challenges still facing gender mainstreaming. This included a more localised approach and partnership between researchers and practitioners particularly in the Global South. Inherent in the JET is the need to conduct more targeted research along contextual, spatial and temporal lines that will inform gender mainstreaming in the JET.

2.10.2. Societal barriers

Apart from women's relationship with energy being confined to household activities, women are categorised as vulnerable and marginalised persons. This portrayal of women assumes a paternalistic and stereotyped perspective of women, confining them to domestic roles and undermining their participation, decision-making capabilities, agency and representation in policy and decision-making, as well as potential actors in the broader economy.

2.10.3. Institutional barriers

Procedural justice moves beyond the quest for an equal numeric representation in decision-making to equal participation in all policy phases. Apart from the fact that women are already underrepresented, the question remains as to how the voices and contributions of women can be heard, Furthermore, how much

thought is given to enlightening women about the opportunities that might draw their greater interest and participation. Understandably, this can still be challenging to achieve at all decision-making levels, particularly for national governments.

Drawing from other energy transitions, (Fraune, 2016) points out that when the German government organised citizens' dialogue sessions to enhance public acceptance of the energy transition, men were significantly overrepresented (Sorman et al., 2020). In a survey conducted by (Sorman et al. 2020), 51% of the female respondents argued that women were excluded from the Spanish energy transition and decision-making. South Africa has an opportunity to draw lessons from these results and given the need to address socioeconomic challenges, South Africa may well have to develop its own blueprint for gender inclusivity.

2.10.4. Gender inequality

A study conducted in the European Union that examined gender equality in the energy transition (Union, 2019), found that the energy sector in Europe was dominated by men who occupied most of the technical positions while women occupied mostly administrative positions. It further concluded that there were gender gaps in energy access with women being more affected by energy poverty than men. The study also found gender gaps in labour absorption of women into clean energy and energy-related education, and underrepresentation of women as energy professionals or in decision-making positions. This study in the global north also gives scope for global collaboration in the quest for gender inclusivity in the clean energy transition.

This study points to the larger and more global problem of patriarchy, social norms, gender stereotypes and the need for a transformational approach to women in society. In the context of a developing country, arguments, such as access to education, skills and finance might be typical economy challenges holding women back. However, their challenges are compounded by the classification of vulnerability which locks them into poverty, unemployment and the perception that they do not have agency and capability.

The conceptual framework in ***Figure 2.1.*** proposes a systemic process which this study has included in making the case for engendering the energy transition in South Africa. It proposes the integration of gender mainstreaming with the core tenets of energy justice principles and the lifecycle of the energy system. It also takes cognisance of the extent and pace of a just energy transition that needs to be planned and implemented with appropriate consideration of the contextual, temporal and spatial dimensions. While there is scope for a macro framework and policies, due consideration needs to be given to these dimensions and their justice implications at more localised levels. In applying this conceptual framework, a gender mainstreaming approach would consider the participation and impacts on women at each stage of the life cycle of a business.

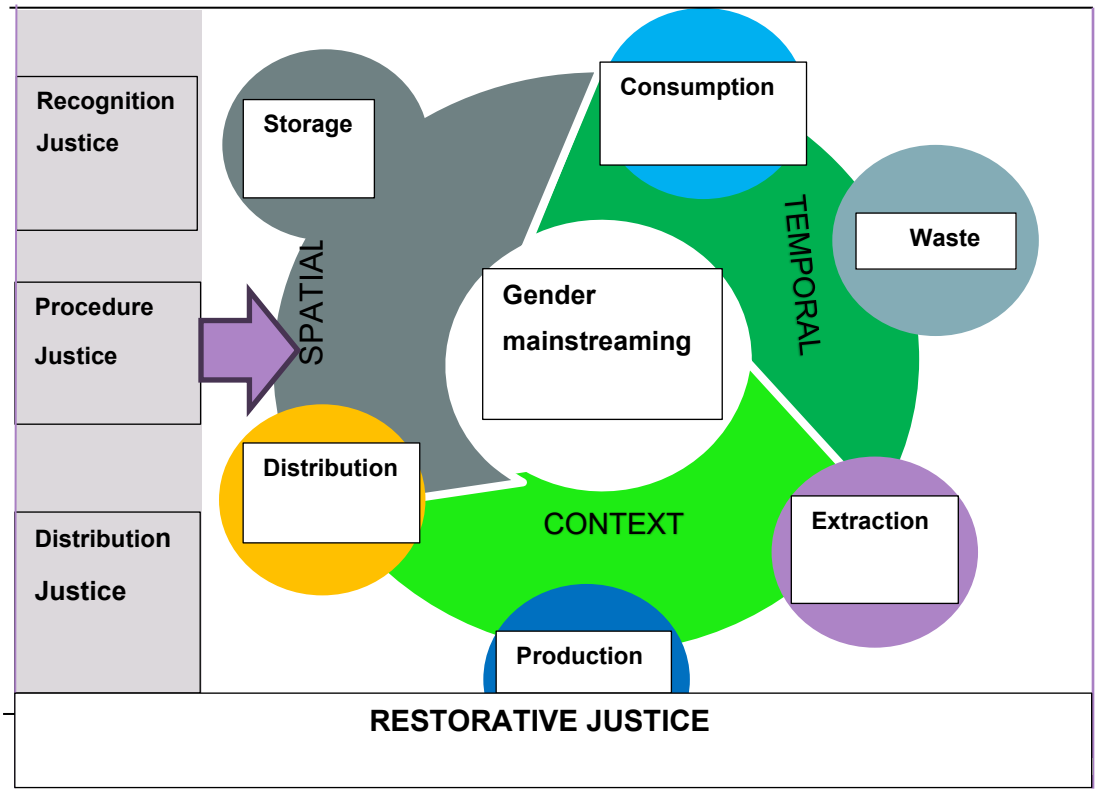


Figure 2.3. **Engendering energy justice conceptual framework**

Author's adaptation of the three phases of decision-making for applying energy justice to practice

Source: Diagram 13: (Heffron, 2022); (Heffron et al., 2019)

2.11. Summary

The energy justice discourse emerged most notably over the past decade alongside the emergence of global energy transitions. (Sovacool et al 2015, p. 95) defined energy justice in their seminal work as “a global energy system that disseminates fairly, both the benefits and costs of energy services, and one that has representative and impartial energy decision-making”. “Energy justice has evolved as a conceptual, analytical and decision-making framework around three tenets: distributive, recognitional and procedural energy justice”. While it emerged from some of the more activist and rights-based foundations of environmental and climate change theory, it has highlighted the need for a human-centred approach in energy transitions which have been traditionally confined to the worldview of technocrats and economists. In so doing, it invited a greater role for social scientists to assist in managing both the technological transitions required while addressing the multiplicity of socioeconomic and environmental challenges facing the world. It also invites a multidisciplinary and interdisciplinary approach to solving a complex problem.

While the theoretical framework is still new and yet to be empirically tested against policy and practice, it is timely in developing alongside calls by the Paris Agreement and the UN SDGs which articulate a similar focus based on justice and equity principles. In terms of the focus of this study, the gender discourse on using an energy justice framework has also begun calling for an engendering of energy.

Building on the emerging and evolving energy justice, gender-energy theories and empirical studies, this study has introduced an adapted conceptual framework that places gender mainstreaming at the centre of the just energy transition for South Africa. In so doing, it seeks to provide an integrating framework that addresses both the need to transition to a low carbon economy while addressing South Africa’s development challenges.

Beyond the social justice and systemic lens that energy justice provides, the conceptual framework adds the contextual, temporal and spatial lenses which assist in addressing the transition at a national, regional and local level. It also

provides for tracking every phase and activity of the transition, based on just principles using a gender lens. The adapted conceptual framework has not included Sovacool's eight principles but regards them as inherent in the core tenets. It has also excluded cosmopolitan justice given the delimitation to South Africa.

2.12. Proposition 1

South Africa's clean energy transition is not fully aligned with the principles of a just transition as it inadequately addresses the socioeconomic impacts particularly on women

The transition from fossil fuels to clean energy in South Africa is in response to its global commitments to climate change. The energy justice framework offers a useful approach to enhance the success of a just transition since it centres around human rights by providing supporting principles that can advance gender inclusivity. This framework assists in identifying the apparent gender blindness in the Just energy transition despite its pronouncements to leave no one behind.

2.13. Proposition 2

Advancing gender inclusivity is essential to achieving South Africa's just transition to clean energy

Advancing gender inclusivity is essential to achieving South Africa's just transition to clean energy. Although women comprise over 50% of the population, they are not equally represented in the mainstream economy. Instead, they are the faces of poverty. While South Africa has signed up to the UN SDGs which include gender equality (Goal 5), and affordable energy (Goal 7), gender inequality persists in women's participation in economic opportunities. A greater focus on advancing gender inclusivity through gender mainstreaming in the energy sector, which is at the heart of most economic activity, will contribute significantly to South Africa's just energy transition and it development and transformational goals.

2.14. Proposition 3

Institutional, socio-cultural, and economic barriers significantly hinder the achievement of gender inclusivity in South Africa's clean energy transition, limiting, women's participation, leadership, and access to opportunities within the sector

Globally women still face the challenge of inequality. However, the challenge is more pronounced in a developing context where South African women face additional barriers. These barriers differ based on intersectionality, such as race, culture, language, and rural and urban divides. These place additional burdens on women, such as limited access to energy, energy poverty and the inability to participate in the energy sector or ensure that gender dimensions are addressed throughout the energy system. The transition of the economy offers new opportunities for South Africa to pre-emptively attend to societal and institutional barriers that exclude the meaningful participation of women in the economy. This study has contributed to identifying barriers to advancing gender inclusivity in South Africa's energy transition using the energy justice conceptual framework.

Table 2.1. Consistency table: research questions and propositions

No.	Research Objective		Proposition
1	Explore South Africa's transition to clean energy within the framework of a just transition	1	**South Africa's clean energy transition is not fully aligned with the principles of a just transition as it inadequately addresses the socioeconomic impacts particularly on women**
2	Investigate the extent of gender inclusivity in South Africa's just transition to clean energy	2	Advancing gender inclusivity is essential to achieving South Africa's just transition to clean energy
3	Identify and examine the barriers to achieving gender inclusivity in South Africa's clean energy transition	3	Institutional, socio-cultural, and economic barriers significantly hinder the achievement of gender inclusivity in South Africa's clean energy transition, limiting, women's participation, leadership, and access to opportunities within the sector

3. RESEARCH METHODOLOGY

3.1. Introduction

This chapter describes the research methodology, the sample selection, the data collection process and the analysis. The trustworthiness strategies were used to collate and conclude the findings and conclusions of this research.

(Braun et al., 2019, p. 594) argued that “the researcher’s role in knowledge production is at the heart of their approach”. In addition, they described qualitative research as being contextual, positioned, situated, interpretive, reflexive and ultimately about meaning and making meaning. This study subscribed to the approach articulated by (Braun et al., 2019). The use of a constructivist paradigm has underpinned the research design. “Many constructivists focus their inquiries on people’s perceptions and interpretations of various phenomena, including individuals’ behaviours, group processes, and cultural practices” (Leedy et al., 2015, p. 26). The nature of enquiry deals with various levels of complexity and competing social actors involved in decision-making about competing priorities, The epistemology applied in this study is one of sharing of understanding, meaning and interpretations from diverse perspectives to addressing the research problem.

Drawing from the literature, (Leech et al, 2007, p. 559) add that if qualitative research is conducted effectively, it can lead to insights into “particular processes and practices that exist within a specific setting, location, time, context, event, incident, activity, and/or experience and it can further inform theory”.

This study used an inductive approach and an interpretivist model that recognised the multiple subjective perspectives and their construction of knowledge and contribution of experience to identify solutions (Greener, 2008).

3.2. Research design

The research method adopted a straightforward qualitative design which used interviews guided by a semi-structured interview schedule, and was aligned with the research purpose and research objectives of this study. Figure 3.1. depicts the research design.

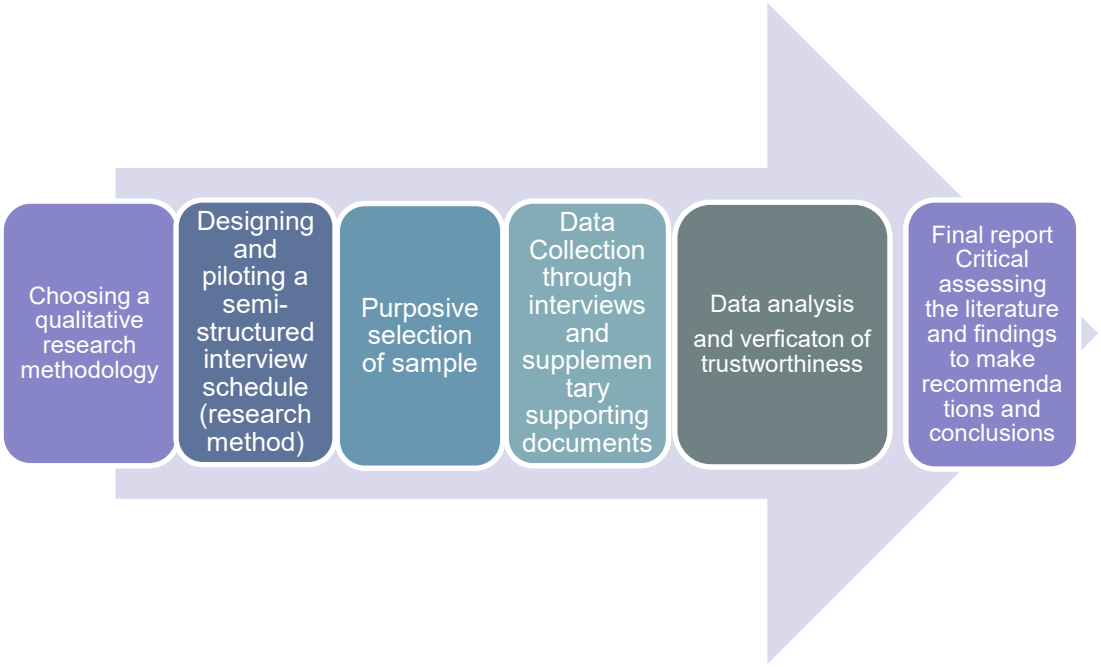


Figure 3.1. Research design

3.3. Data collection methods

The data collection procedure involved interviews with 11 key informant interviewees (KIIs) who were selected using purposeful sampling. Citing (Patton, 2002), (Staller,2021), describes purposeful sampling as that which yields rich information, elicit insights and contributes to in-depth understanding,

In addition, important documents, such as South Africa's Just Transition Framework, Just Energy Transition Implementation Plan and Just Investment Plan were reviewed as secondary data. The PCC website was a useful source of information for collated minutes, reports and video recordings of the Just Energy proceedings and stakeholder engagements as they unfolded. These documents

provided further evidence and assisted in comparing and corroborating as an additional qualitative method (Bowen, 2009).

Sample and sampling method

The sample size of 11 was small, therefore, it was paramount to identify participants who collectively had the range, and depth of knowledge of the key themes, and the experience to represent the broad constituencies. (Hennink et al, 2021, p. 9) argue that an effective sample size is "less about numbers and more about a rich and nuanced account of the phenomenon studied". Citing (Young and Casey,2019, p 12), they add that "rigorously collected qualitative data from small samples can substantially represent the full dimensionality of people's experiences". In line with this thinking, (Leedy et al., 2015) suggestion of a selective and purposive sampling method was suitable. They further advise that the researcher should choose those individuals who would yield the most information about the topic being investigated (Leedy, 2015). Furthermore, in dealing with a complex research problem, the sample should include diverse contexts and situations. The sample should be able to provide information beyond the normative and be equipped to contribute knowledge, experience or information on a variety of phenomena about the research (Leedy, 2015).

The sample of 11 KIIs comprised predominantly senior executives from several institutions including national government, local government, the private and public sector, and non-governmental organisations. All of these were implicated or involved in the matter of energy and /or gender and energy transition and considered experts in their fields and the subject matter of this study

As the context of this study was situated in energy justice theory which encouraged a multidisciplinary and interdisciplinary approach, sample selection was purposefully selected to reflect this.

Greener's (2008) reference to purposive sampling is that even though the population for the research may be small, it comprises people who are thought leaders, have wide reaching constituencies or influence and might have multi-

disciplinary backgrounds or work in interdisciplinary teams. The sample of KIIs were approached with these criteria in mind.

3.4. The research instrument

The choice of a semi-structured interview schedule allowed for a set of general or specific questions aligned to the proposed theoretical and conceptual framework, and the research objectives. This ensured consistency and that key information was extracted for comparability. As the sample was diverse, a semi-structured interview allowed for open-ended questions and greater in-depth probing where there were rich sources of contextual information and further interpretation required. This was also useful for accessing secondary information and contributed to theory building, policy and practice.

The semi-structured interview schedule comprised nine questions with three allocated to each research objective (see Table 3.1*)*. Questions were open-ended and ensured a guided and structured process for the researcher. Open-ended questions can lead to rich, diverse information and insights, and allow for probing responses that are extremely useful for the research agenda. Cresswell (2007) suggests the interview schedule should be linked to the overarching research question and sub-questions. He also suggests piloting the questions for further refinement and to ensure that questions are not leading (Cresswell, 2007, p. 133). Piloting the questions was conducted with three colleagues.

3.5. Procedure for data collection

Data collection began with setting up appointments with KIIs. As ethics clearance was only received at the end of November 2024, interviews were conducted between December 2024 and January 2025. The participation and consent letter were on the university letterhead, explaining the objectives of the research and inviting selected participants to an hour-long virtual interview.

Issues of confidentiality and anonymity, audio recordings and transcription of the interviews were mentioned in the letter and reiterated at the beginning of each

interview. The interviewees were approached directly and interviews proceeded based on written consent.

3.6. Demographics of the sample

Purposive sampling was employed to identify eleven key informant interviewees (KIIs); referred to as the participants. Due to the small sample size, participants were selected based on being thought leaders who had extensive influence and multidisciplinary expertise or experience in interdisciplinary teams.

The selection process included individuals from various sectors of society, such as policymakers at the national and local government levels, leaders in clean energy collectives, non-governmental organisations, as well as professionals and entrepreneurs in the clean energy sector who focused on energy and gender issues.

The sample comprised two men (one white) and nine women (one also white). The remainder of the sample was black. All participants had over twenty years of professional experience across disciplines, which included engineering, finance, environmental science, business development in clean energy, specialist technologies, development, gender studies, and social sciences. The participants have postgraduate qualifications, such as masters and doctorates. All are involved with or are knowledgeable about the just energy transition. Two civil society representatives were invited but did not respond.

Table 4.1. Naming conventions of the participants

Classification of Partipants	Position	Code Number
National Government	Senior Manager	JT- PO2
Gender/Energy/Climate Change	Senior Manager	JT- PO6
Local Government	Senior Manager	JT- PO10
Industry Association	Senior Leader	JT- PO7
NGO: Energy/Gender	Senior Manager	JT- PO8
Women's Organisation in Energy	Senior Leader	JT- PO5
Professional Women in Energy	Engineer/Technical	JT- PO1
Women Entrepreneurs in Energy	Owners/Managers	JT- PO4
Business Owners in Clean Energy	Business Owner/Entrepreneur	JT- PO11
Academia/Research Think Tank	Senior Manager	JT- PO3
Technical Institution	Senior Manager	JT- PO9
TOTAL SAMPLE		11

3.7. Data analysis and interpretation

Greener (2008) suggests that data should be coded in a manner aligned with the questionnaire and its research focus. This would ensure that the data was congruent and complete and allowed the researcher to identify possible gaps (Greener, 2008). A code is the smallest unit of analysis which can vary from one word to a phrase or paragraph. Its significance is that it helps identify categories, themes, concepts and theories for analysing and interpreting the data (Saldana, 2009).

(Cohen, 2007) suggests that with the volume and complexity of sifting through the data, there should be early or immediate analysis. This would avert overload and enable data capture and analysis. (Cohen, 2007) suggests that because data requires in-depth interpretation with the possibility of multiple interpretations, the researcher should adopt a "fitness for purpose" approach. By way of example, the data's purpose is to explain, describe patterns, raise issues or prove or demonstrate something (Cohen, 2007). Regarding this study, such purposive

words were included in the questions and, therefore, helped categorise the data. Furthermore, issues were raised to prove or demonstrate a response to the research objectives.

According to (Cresswell, 2007), “researchers build their patterns, categories, and themes from the bottom up, by organizing the data into increasingly more abstract units of information.” He describes this as an inductive process that requires the identification of themes and the establishment and continuous update of a database until a comprehensive thematic foundation emerges (Cresswell, 2007). Referring to this study, an important theme to be interpreted was the word “just”. The anticipation was many words or phrases would need to be decoded to lead to various categories of justice; and ultimately, how each participant interpreted the concept and linked it to constructs, such as inclusivity, equality and justice.

Data analysis, therefore, also involved making sense of how the participants understood the concept or phenomenon that the research questions were trying to address (Cohen, 2007).

Thematic analysis (TA) was considered suitable for this study. TA systematically identified and organised themes across the data set allowing for a sense of collective and shared meanings of the participants’ experiences. The emphasis was on identifying what was common and then synthesised the features of those commonalities (Braun et al., 2012, p. 57). After coding and synthesising the data, the key emerging themes that emerged included: Justice, Transitions, and Equity. A process of triangulating the data from the Literature review, the interviews and secondary data from the PCC website was analysed and discussed.

TA being both accessible and flexible is useful especially when the research topic is multilayered in its concepts, theories and practical application. TA lends itself to inductive versus deductive or theory-driven data coding and analysis, experiential versus critical orientation to data, and an essentialist versus constructivist theoretical perspective (Braun et al, 2012). This study sought to make meaning of the data, test the materiality of the energy justice theory and

the engendering of the energy conceptual framework. This was in response to the overarching purpose of “how gender inclusivity can be further advanced to ensure South Africa’s just transition to clean energy?” A combination of inductive, theory-driven data analysis together with a critical and constructivist theoretical lens was used. An inductive approach is from the bottom-up and is informed by the data. This meant that the eventual synthesis and findings closely matched the codes and themes derived from the content of the data. Consequently, what was mapped during analysis closely matched the content and interpretation of the data (Braun et al., 2012; Vaismoradi et al., 2013).

The following six phases are suggested for thematic analysis (Braun et al., 2012):

- *Familiarising yourself with the data* – This involves immersion in the data, reading and re-reading transcripts or reviewing other data sources with cursory notetaking.
- *Generating initial codes* – The first stage of developing codes is treating them as building blocks of various levels of information and interpretation.
- *Searching for themes* – Themes begin to emerge and start connecting with the research problem.
- *Reviewing potential themes* – This involves checking themes against all the data to develop greater coherence with the various elements of the data set.
- *Defining and naming themes* – Themes will vary with the lens they provide or the dimension they highlight in the study. Their function is to add to the overall coherence of the narrative, which would be descriptive, conceptual or interpretive.
- *Producing the report* – Producing the final report begins at the start of the data analysis and is a continual and cyclical integrating process to convey a compelling story in the end.

Following the interviews, the initial process of familiarisation with the data included listening to the recordings and reading through the transcripts. This was followed by tabulating each participant’s answer against the respective research propositions and questions, and manually highlighting codes, concepts, patterns

and constructs. It included notetaking of insights and correlations that would contribute to the analysis linked to the conceptual framework. Ultimately, the overarching themes emerging from this study revolved around variant and congruent understanding of justice, transition to clean energy and gender equity.

3.8. Limitations of the study

- *Availability of the most resourceful participants* - Given that the interviews were conducted during a holiday period, it was challenging to schedule the interviews, but all the participants were keen to participate.
- *Time consuming* - The process of reading through the transcripts and organising the information was time consuming since it was done manually. However, it supported the process of familiarisation with the data and deductive processing and analysis of the information.
- *Complexity of too much information and variables* - The topic and purpose were complex. The participants were drawn from a variety of sectors making it challenging to synthesise the data. However, it also contributed to a rich set of perspectives to address the complex topic.
- *Lack of gender awareness on the part of more technical people* - While it was true that participants presented different levels of gender awareness and had different frames of reference, this still provided interesting, complementary and diverse insights.

3.9. Trustworthiness

An advantage of using the qualitative approach in this study was that the researcher was able to discern and follow through on patterns and make meaning based on interactions, whereas the standardised approach of quantitative methods would not have been able to elicit these (Leedy, 2015). The reliance on perception or discernment, does, however, need to be mitigated against bias or predetermined expectations and theories. Leedy (2015) therefore, suggests the need to be reflective and self-aware of social, philosophical and political bias to mitigate potential bias.

Strategies to enhance trustworthiness

To reduce elements of doubt about the veracity of a study, triangulation assists in combining components, such as theory, observation and literature to verify and enhance credibility (Noble et al., 2019). “Triangulation is a method recommended to increase the credibility of research findings” (Noble et al., 2019, p. 67).

This enquiry lent itself to the combination of triangulating between literature, data from the interviews, and data from sources, such as the PCC to “explore and explain complex human behaviour”. Triangulation is also a strategy to help explore and explain complex human behaviour using various methods to offer a more balanced explanation by augmenting data sets.

According to (Elo et al., 2014, p. 5), to accomplish trustworthiness “the success of data collection should be assessed in relation to the specific research questions and study aim”. Their research emphasised the unit of study and whether it can be easily categorised and abstracted in response to the research objective. One way to test credibility is to consider the “conformability of findings”, which refers to the degree the data were effective in representing accurate responses of participants that correlate with key concepts and meaningful interpretation to answer the research objective. Actual quotations from the participants connected to the research concepts and their interpretation enhanced credibility, however, too much reliance on quotations could dilute the results. “An accurate description of the analysis and the relationship between the results and original data allows readers to draw their own conclusions” (Elo, 2014, p. 6).

Reflexivity – Cresswell argues that the researcher declare or be aware of their own biases and prejudices that might shape their positionality and, therefore, affect their interpretation or approach to the study (Cresswell, 2007; Whittemore et al., 2001).

While this study has tried to maintain balance in terms of quotations to enhance credibility, the researcher has included a reflexive analysis.

The researcher has worked at the forefront of energy and climate change over many years, with gender over the past five years, and is familiar with many of the strengths and weaknesses in the government and the private sector.

The researcher is known to all the interviewees as a former or current associate.

It was important, therefore, to follow all the processes of official communication and recording of interviewees, so as not to undermine the credibility of the interview process.

The researcher has also included several quotations verbatim to safeguard the veracity and trustworthiness of the responses.

In addition, the PCC website contains numerous documents and recordings that were useful in verifying or corroborating information.

The researcher holds no position of authority over the participants and does not regard any of the participants as friends. The researcher does, however, know most of the participants well enough to respect the leadership role they each play in their constituencies. The researcher also felt that it was important to follow the interview guide with rigour and ensure the interviewees' understanding of the question. The researcher also rebutted the suggestion that the questions be shared ahead to ensure authentic responses.

3.9.1. Transferability

Transferability is achieved if the findings of a qualitative study are transferable to similar settings. A thick description of the setting, context, people, actions, and events is needed to ensure transferability in qualitative terms. Transferability can be used to determine the potential relevance and implications of a qualitative study for other contexts. (Stalmeijer, 2024). While the focus of this study was on the clean energy transition, the rich responses regarding justice, transitions and gender equity can be transferable to several other contexts.

3.9.2. Credibility

To ensure the trustworthiness and plausibility of qualitative research, one of the criteria used is credibility. This means that the participants involved in the study found the results true or credible (Yilmaz, 2013).

Several strategies to enhance credibility were used in this study; one being “thick description” (Tracy, 2010, p. 843) which referred to the rich illustration and comprehensiveness of information provided by the participants. Credibility is also enhanced by using tools, such as triangulation to corroborate information and systematic connections between coding, and the development of concepts, themes and constructs that respond to the research objective and questions.

3.9.3. Dependability

Dependability is concerned with congruency between the research design and whether there is a convergence between the paradigm and the role played by the researcher (Yilmaz, 2013). This requires clearly articulated research questions, a selection of a suitable sample and a degree of convergence between participants’ responses, as well as with other data sources. It is also important that there is data saturation in response to the range of research questions. The findings of this research certainly provide rich evidence of corroboration, complementarity as well as variable responses among the sample.

3.9.4. Confirmability

Confirmability arises through the analysis of the data which leads to the findings and conclusions which can be examined through an auditing process (Yilmaz, 2013). This requires sound record-keeping and processing of data so that it is possible to verify information throughout the value chain of analysis. A clear record of the methodology was used; processes of triangulation and the elimination of bias were some steps taken to ensure confirmability. Ethical considerations

(Brown, 2022) describes recent developments in the social science landscape which has seen a plethora of research conducted for academic and non-academic reasons. These include the growth in the knowledge economy in the 21st century, the impact of COVID-19 in casualising academic research contracts

and the increase in the number of students needing to pursue postgraduate qualifications. Therefore, greater attention is necessary for social sciences to understand research ethics.

Participants were treated ethically; they were approached to voluntarily participate in this study. They were all contacted by email. The correspondence made it clear that consenting to the interview was voluntary and participants were free to withdraw at any time during the process. The interview was confidential, and anonymity was assured with any identifiable information removed from the report. The data collected is stored in a secure format that only the researcher has access to.

3.10. Summary

While the purpose of the study was the motivating force, the research methodology and processes were critical to producing credible and meaningful outcomes. While the sample was small, its composition led to a useful set of perspectives which are distinctive depending on which constituencies the participants represented. The easy access to the PCC website also provided transparency into the processes followed and gave useful insights to scope this research.

4. KEY FINDINGS OF THE STUDY

4.1. Introduction

The findings are organised according to the key research questions related themes and concepts. Applying the Energy Justice and Engendered energy framework, the discussion concerns what a just transition means for South Africa, reviews the processes and progress, and examines an inclusive approach, using a gender lens with a particular focus on women. Emphasising that no one should be left behind, it identifies opportunities, impacts, and barriers women might face, and suggests how to address these issues to promote women's inclusion in the energy transition.

4.2. South Africa’s transition to clean energy

4.2.1. A Just Energy Transition

Given the range of sectors, professions, constituencies, and identities of the participants, there were varying perspectives and points of emphasis in defining what constituted a just energy transition. There was also a question about how broadly the concept of just should extend regarding energy transition.

Many participants discussed the transition in the context of South Africa's need to reduce its reliance on coal as the primary energy source of electricity generation. This move is part of South Africa’s commitment to global decarbonisation efforts while also addressing the challenges of poverty, unemployment, and inequality.

While most participants perceived transition as inevitable, they questioned whether South Africa's obligation to decarbonise was just and what justice meant in the wake of its development challenges. This concern was heightened by a view that the South African economy has not experienced growth in over 20 years, thus making it expensive to bear the cost of a transition, while ensuring a just process. A poorly managed energy transition could increase the disparity in an already unequal society.

Most participants agreed on a human-centred approach to the transition, despite their differing interpretations of the term "just”.

JT-PO1 expressed the view that “*the word just had many interpretations out there”* and “*there was no silver bullet to what a just energy transition looked like.”* South Africa was in the process of developing its own blueprint of what a just energy transition would look like given its unique context and characteristics.

> *Developed countries have not necessarily transitioned successfully – in terms of energy or it being a just process.* JT-PO1

While most participants acknowledged the necessity of mitigating job losses and a negative economic impact, several highlighted the inevitability of such

outcomes, as well as unintended and unforeseen consequences, particularly in coal communities. There was a strong focus on what justice entailed, particularly concerning job losses for workers and communities involved in the coal value chain. In addition, there were concerns about livelihoods, and the impact that the transition would have on energy affordability, and access to energy. The complexity of ensuring a just transition is articulated in the following response:

> *Though efforts may be pursued to ensure a just transition – some job losses are inevitable due to how other/adjacent sectors are impacted and issues of skills/capacity.* JT-PO2

The reference to adjacent sectors in the context of Mpumalanga refers to those, such as agriculture and tourism and other secondary services. To what extent would these sectors be positively or negatively impacted, and would there be opportunities for labour absorption, re-skilling and upskilling? Since the coal sector impacts the natural ecosystem including air quality, biodiversity, water and land usage, questions of rehabilitation and alternative use of these natural resources also need to be considered.

Some participants argued that it was essential to balance the choice of energy source with the socioeconomic impact and its contribution to economic growth. Therefore, they recommended a pathway of collaboration and discussion given the complexity of the issue. JT-PO7 also underscored the importance of extending a thoughtful approach to related sectors, such as water, agriculture, and tourism in regions like Mpumalanga. It was also highlighted that despite Mpumalanga being the centre of coal energy production, it should not be taken as representative of how the transition is unfolding across the country. The context of the just energy transition, therefore, must also be considered regionally and locally.

A further argument in support of a just process, was to take cognisance of the socioeconomic impact on marginalised communities and those likely to be excluded from decision-making, and the need for redress as captured below:

> *As a country – because we are reliant mainly on an unclean source of energy that pollutes the environment, we have an obligation to transition*

> *to clean energy. We need to do so in a manner that considers those who may be negatively affected, e.g. women, youth, marginalised communities, and those who will lose jobs. "Just" includes processes and procedures that are inclusive and apply redress to those affected.* JT-PO6

Two participants also warned that the energy transition should not be viewed as a panacea for all injustices in the country. Instead, the transition should be seen as presenting opportunities for re-industrialisation of the country and therefore, presenting opportunities and enabling other sectors of economic activity to support more just outcomes.

Participants who were more emphatic about both the process and outcomes of the transition needing to be fair argued for consideration of historical factors, inclusivity in participation and decision-making, and equality in access to the benefits of the transition.

> *The historical context of the country must be considered, the mistakes of the past which led to many people being excluded, left behind. Hence, anything we're starting now that is new, must include everyone, benefit everyone. The transition in the energy sector must be seen as an opportunity.* JT-PO9

Another participant argued for a bottom-up approach to ensure an equitable and inclusive transition.

> *Has to be community led first – start at the local level and then go up. What is happening at the local level has to inform the decisions that are taken at national level – this must inform the processes or policies, also needs to be gender sensitive, community level and include intersectional elements of society. Must include rural, peri-urban and urban, as well as township areas.* JT-PO8

Yet another participant was concerned that the transition should not be perceived as "*Benefit for those who have money – wealthier people".* JT-PO4

The very real fear expressed above is that those able to invest in renewable energy would be foreign investors, multinationals and traditional fossil-fuel companies which might be more inclined to chase profit rather than purpose.

On the issue of equal participation in decision-making or representing various voices in different sectors of society, another participant defined the word “just” as follows:

> *Just means representation and having a voice, being taken seriously, inputs being well considered – intentional. Just means inclusion in discourse on energy transition.* JT-PO5

The sentiment above suggests a level playing field where communities have equal rights to participation and decision-making alongside large investors and conglomerates.

4.2.2. Transition to clean energy



Figure 4.1. Illustrated response to the energy transition

Figure 4.1. demonstrates that energy transition is an important theme with wide-ranging consequences. The transition itself is a primary concern even though the substantive issue is energy. This suggests a concern with the process and the

impact of the transition itself. Three of the related considerations around the transition attempt to capture the key issues raised by the sample. These include drivers of the transition, pace of the transition and managing the transition.

4.2.3. Drivers of the transition

Some participants noted that South Africa needs to transition due to climate change commitments, global decarbonisation efforts, and the potential impact of these commitments and efforts on the economy and energy security. Failure to decarbonise can stymie economic growth and development through trade barriers against carbon-intensive goods. The energy security challenges presented by ailing coal-fired power stations present opportunities to invest in clean energy to boost energy generation. JT-PO3 described this as a process driven more by the load-shedding impact than by addressing the climate change crisis. This supports the point that while climate change is a significant threat, the accelerator for the transition is likely to be the recent impact on energy security.

Some responses also added the increasing electricity costs and the necessity of lowering carbon emissions due to climate change. Concerning lowering carbon emissions, the potential impact of carbon border adjustment taxes (CBA) on high emitters, suggests a negative impact on South African exports of carbon-intensive products.

JT-PO5 highlighted that the recent acceleration of the transition was influenced by various factors. These included disruptions in the supply chain caused by COVID-19, geopolitical challenges arising from the conflict between Russia and Ukraine and its effect on Europe's energy supply, as well as several other geopolitical shifts.

JT-PO1 referred to the transition as being “top of mind politically for everyone and gaining traction”. The urgency was attributed to the energy security challenge, which increased the pressure on the government to expedite its efforts in supporting the generation of clean energy.

4.2.4. Pace of the transition

Participants generally agreed that the transition has been slow and initially lacked urgency. JT-PO1 described the transition as "not smooth and seamless but rather perceived as disjointed". JT-PO1 further added that the just energy transition was reactive instead of proactive. The abrupt shift away from coal resulted in individuals losing jobs without readily available opportunities to address the resulting socioeconomic challenges. This perception of the transition being slow and disjointed does question South Africa's long-term plan and vision for its energy future.

Three participants mentioned corruption as a factor which had slowed down the transition. One highlighted initial private sector enthusiasm for the REIPPP bids, which was dampened by an uncertain "staccato" approach and misalignment with the government.

Another participant noted that the transition started nearly twenty years ago with voluntary efforts by the private sector, responding to government energy efficiency policies and the introduction of the Renewable Energy Independent Power Producer Programme (REIPPP). Again, this speaks to a deficit in a cohesive long-term strategy for South Africa's energy future and its significance for the economy.

> *The introduction of REIPPP by DMRE was a milestone achievement in 2011 world class programme, competitive, devoid of corruption.* JT-PO7

The REIPPP was lauded for its transparency and drew international acclaim for its processes and the opportunities it presented but its ensuing protracted delays in implementation provide lessons for the current transition. Most participants agreed that the pace has accelerated in recent years. They attributed this acceleration to several factors, including the global push for decarbonisation related to climate change and South Africa's recent energy security issues.

The Paris Agreement's Just Transition pronouncement in 2015 which led to the JT launch at COP 26 was also cited as boosting energy transition efforts under the President-led PCC. The development of the JT framework and the JET Implementation and Investment Plan by the PCC has further supported the transition. In addition, recent legislation, such as the Energy Regulation Amendment Act of 2024, and increased allowances for decentralised private energy generation have contributed to the perception of a shift towards clean energy, while energy security challenges or load shedding have fast-tracked these changes. A participant noted, however, that while the PCC was doing good work, it needed greater public awareness and engagement.

4.2.5. Managing the transition

Participants generally believed that a successful transition requires intentional leadership, a systems and inclusive approach, upskilling, new skills pipelines, funding mechanisms, and closely monitored policies to ensure an equitable energy transition. Participants identified both challenges and opportunities, all of which required skilful leadership at various levels and across sectors.

Some participants identified challenges in funding pragmatic and suitable solutions. For example, microgrids could be useful but require substantial investment and experience to produce at scale. This is illustrated in the following response:

> *While the introduction of microgrids might present a solution, you need money and big production experience to do it at scale. We don't place enough value on institutional frameworks, knowledge and experience. Such experience that can hit the road running, has the human resources or agility to access the human resources, attract and retain relevant talent to implement transition plans that are pragmatic in solving the problem.* JT-PO2

Eskom was also highlighted as a significant role player in managing the transition. Its role is crucial in connecting clean energy to its transmission and distribution

grid infrastructure. While the need for acceleration was acknowledged, there were processes which required time, authorisation and following certain policies and procedures.

The transition requires proper planning, and all the stakeholder consultations are time-consuming. The transition is not easy when there are so many variables to consider. This argument is further substantiated in the following response:

> *A Greenfields project would have been much simpler but we're talking about transitioning a brownfields project. Lots of considerations like what to do with existing infrastructure that is there and may not be needed, what happens to the suppliers? Don't just close the plant without knowing what's going to substitute it. Needs parallel processes and thinking about things holistically.* JT-PO9

There was a perception that the government and the private sector work in silos and must ensure that everyone is brought on board.

Some participants also raised the need to manage competing vested interests. Some investors understand SA's obligations**;** the need to address climate change and even reduce health impacts, and those with vested interests in transitioning to clean energy for economic returns on their investments. This is even though they may not have created jobs or invested in communities and made no transformational contribution to the economy. This lobby is supported by or is part of the global lobby. Regarding the global lobby, one of the participants highlighted that

> *Renewable energy lobbyists, who are heavily funded from the Global North and other parts of the world, lobby for technology and not economic prosperity of the country but to advance the prosperity of their own countries. They aim to export large quantities of components, products and systems. They also repatriate revenue from SA back into their own countries.* JT-PO5

The second group were described as anti-transition due to vested interests in continuing the coal value chain and argued about baseload and that "we cannot

abandon the gift of coal as a naturally abundant resource – the bedrock of the economy".

Then there are the green lobbyists, and environmental people who argue that "we cannot keep investing in dirty energy – we must invest in renewables".

Another participant captured the threats to transition management in the following statement:

> *So, it is very complex, and we see tensions between ministries who speak publicly at cross purposes and confuse people – make it appear that we don't know what we are doing*. JP-PO10

Most participants acknowledged the ongoing transition, recognising opportunities from new technologies and value chains. They viewed energy as an end and a means to support other economic and social sectors and activities. Participants emphasised the importance of being contextually mindful, planning an inclusive approach for South Africa's energy future. A just transition needs firm leadership and to be carefully managed and communicated to yield just outcomes was underscored by the following quotes:

> *We need to maximise opportunities that arise from clean energy – opportunity for re-industrialisation, manufacturing. We need lots of forward planning – more awareness to broader society about what the PCC is doing. Just is not only about coal but associated sectors.* JT-PO7

> *Although the transition has been a long time coming – greater intentionality and focus have been evident more recently. Evidenced through greater political leadership and interventions and structures being put in place.* JT-PO7

> *They need to ensure people understand what their plans are, how they are going to benefit from those plans and how they may be impacted by those plans. The discussion, e.g. green hydrogen is above the heads of communities.* JT-PO8

Finally, municipalities must be considered in how the transition would affect municipal revenue. Also, as they are the face of local service delivery and local economic development, they, therefore, must be more intricately included in managing the transition. The exclusion of active engagement with local government would be a serious oversight given that various licences, land allocations, rezonings and permits are managed at this level of government. The reference to the role of local government is particularly relevant since this is especially where visionary leadership, competent planning and contextual understanding of energy needs are best undertaken. Unfortunately, many local governments are dysfunctional or not functioning optimally even though they are at the forefront of service delivery, community engagement and the impact of climate change.

4.2.6. Professional requirements

The participants noted that the energy sector tends to focus on technological and economic factors. Historically, it has been a predominantly male sector requiring technical skills and physical labour, often associated with men. Given the existing gender stereotypes and biases, the investigation into professional requirements explored how the shift to clean energy might change the perspective on women's participation in this field. Further discussion relating to professional requirements includes foundational skills and competencies, the changing landscape and gender inclusion.

Participants stressed the need for engineering and technical skills to design and build infrastructure. Artisan or technical skills are essential for construction, manufacturing, maintenance, repairs, and performance monitoring. Technical skills are crucial for installation, operation, maintenance, quality control and diagnostics in the renewable energy value chain.

Many participants noted that the industry provided opportunities for developing new skills, professions, and business models. As these new industries are often Greenfield projects, there is a chance to revise the perception of energy as an exclusively male-dominated sector.

While sciences are essential for professional skills, the renewable energy industry also requires financial experts to structure deals, legal professionals to create contracts, environmentalists for EIAs, and HR specialists for recruitment, training and talent retention.

JT-PO9 noted the rise of consulting firms that support the clean energy sector by offering technical and support services. These firms relieve companies from hiring additional experts for short-term needs. They introduce a more agile business model and inclusive culture compared to traditional male-dominated enterprises.

JT-PO9 suggested that consulting may appeal more to women. JT-PO1 highlights numerous opportunities in the clean energy value chain, from extraction to waste management. A life cycle approach would also address the disposal or recycling of solar panels and batteries to tackle toxic waste, using a circular economy model. In addition, JT-PO1 believes new professions will emerge, revitalising manufacturing and requiring specialisations, such as wind and solar engineers; specialist roles not heard of before and each with the potential to create their own value chain. This industry expansion might also create new roles in the financial and legal sectors.

> *If I just look at myself, what I am doing now did not exist in this economy and that gives you a window of what I am doing now.* (JT-PO1)

According to JT-PO2, private sector roles should be mirrored by the public sector. For instance, JT-PO3 emphasised the need for policy research and development alignment. The DFFE needs professionals to approve EIAs and verify emission reduction data. In addition, government departments must develop transportation, distribution, and storage standards for safety and trade. Adequate personnel with these skills are required across various government spheres.

Other disciplines include social sciences, which involve conducting research, using indigenous knowledge, raising awareness, and advocating for the energy transition. Engagements with communities and stakeholders are also important. Educational institutions, from basic education to universities, play key roles in

raising awareness, curriculum design, skills development, and research and innovation.

Most participants also highlighted the necessity for artisan and technical skills essential for the construction, installation, maintenance, and repairs required during the various stages of clean energy project development. JT-PO9 observed that the concept of "transition" would be integral to every job. To illustrate this point, how career opportunities are portrayed by actors in their gender constructs could encourage more women to enter the energy industry. With additional training they could be lawyers, financiers, insurers, teachers, community workers, and property developers in their role within clean energy projects.

4.3. Gender inclusivity

> *Our transition must take cognisance of historical issues and must, therefore, assist us not to only reduce carbon emissions but also address the triple challenge.* JT-P10

The above argument was echoed in one way or another by many participants. Women are the most affected in the categories of inequality, unemployment and poverty. This challenge is exacerbated by the fact that many women head up single-parent households and therefore, are responsible for feeding into the base of the economy or eroding it by being excluded. At the same time, if those managing the transition were serious about this being a fair and inclusive process, they needed to address the barriers that deterred women from active participation in the transition. As one of the participants added:

> *It's not just about one energy source replacing another but also other factors, e.g. demographics, such as age, gender, and younger women who are economically active or viable. Then also look at women in relation to unique challenges such as caregiving responsibilities, access to energy information, and internet connectivity*. JT-PO1

Another participant highlighted that the closure of traditional energy generation plants, which have been an important employer and supported secondary

industries through their value and supply chains, would have dire consequences for women. They are predominantly active in these secondary activities, such as logistics, supplies, cleaning services, food services and community services in roles, such as teachers and nurses in the communities where coal mines and power stations are located.

One participant warned that renewable energy companies, particularly international investors had no real commitment to addressing local socioeconomic challenges. They simply ticked the boxes by giving women symbolic or token shares in their companies with no real inclusion in their business. This view is captured in the following response:

> *The transition seemed to present opportunities for inclusion of women, would offer empowerment of women and previously disadvantaged people. In reality it hasn't met expectations. Hasn't benefited everyone. JT-PO4*

4.4. Summary

While most participants support the transition to clean energy, concerns about its fairness compared to developed countries persist. A human-centred and inclusive approach is essential to ensure that marginalised groups are fairly considered.

The need for a shared understanding of what constitutes a just transition was emphasised. Although the transition has been slow and fragmented, there is a perceived acceleration due to global decarbonisation efforts, South Africa's recent energy security challenges and new regulations promoting private and decentralised energy generation. Initiatives like the JET framework have added momentum.

Some view the transition as an opportunity for re-industrialisation and envisioning a new energy future, but caution against expecting it to fix all areas of injustice beyond the energy sector. Energy also needs to be seen as an enabler for other sectors.

Participants agree on the necessity for strong leadership, societal engagement, technical skills, and financial mechanisms. Optimistic participants see numerous opportunities in the renewable energy sector, including gender inclusivity and new roles for women in multidisciplinary professions. However, others worry about the realisation of these opportunities, given the skills requirements, gender intersectionality, accessibility, and the potential dominance by traditional fossil-fuel investors in the clean energy sector.

Finally, applying a just energy framework could enhance just energy transition if the issues raised in this study are addressed satisfactorily. Recognition that the transition is complex and requires robust leadership and a “whole of society approach” is paramount. Despite government efforts to implement the JT framework under the president’s leadership, concerns remained that much more work needed to be done to ensure that no one was left behind, even in developing a shared understanding of what the word “Just” meant in the South African context.

4.5. Gender inclusivity in South Africa’s just transition

4.5.1. Inclusivity

Gender inclusivity in South Africa's energy transition requires intentional, purposeful, and deliberate efforts to include women at every stage. It goes beyond numerical representation, requiring a targeted intersectional approach to decision-making and leadership. Inclusivity aims to address inequality, unemployment and poverty and consider access and affordability issues. A gender lens should be applied through every phase of the transition, ensuring fairness and equity in all settings. This involves creating employment opportunities, supporting women's entrepreneurial ambitions, and providing tertiary and vocational training in the energy sector. Inclusivity is discussed further in terms of gender considerations.

4.5.2. Gender considerations

Participants noted that new technologies must consider South African women's economic challenges, making clean energy accessible and affordable. Lack of

access to clean energy increases health risks and affects economic productivity. Inclusivity should account for women as both consumers and contributors in the energy sector, highlighting their role in households and various value chain activities. One participant emphasised women's “vulnerability" is often overlooked including diverse marginalised groups with different challenges.

> *This umbrella term loses the uniqueness of women. The voices of women are heard distinctively and not as just part of the marginalised. Being able to recognise, acknowledge and accept their input in the whole process.* JT-PO8

Concerns were raised about women's vulnerability to sexual harassment and gender-based violence (GBV) in male-dominated workplaces. The sudden closure of the Komati-Poort power station impacted the community, increasing unemployment and leading to a rise in GBV incidents. One participant noted:

> *Gender considerations are required to anticipate problems that can emerge from a transition, and one should draw lessons from Komati-Poort to help anticipate problems elsewhere.* JT-PO2

It was further argued that inclusivity needed to consider*:*

> *Systemic barriers that perpetuate discrimination based on gender, intersectionality of race, disability, sexuality.* JT-PO5

To achieve inclusivity, baseline data should be collected before implementing changes. Actions must be aligned with success indicators and tracked to measure impact. Practical steps beyond symbolic pledges are needed to promote equal opportunities and remove barriers. Participants suggested raising awareness and sharing knowledge through case studies and guidelines to predict or prevent negative impacts from transitioning to clean energy.

4.5.3. A gendered lens on the transition to clean energy

Opportunities for greater participation of women

Some participants suggested that the energy transition presents an opportunity to design and re-imagine the energy future that includes women while addressing

inequality, unemployment, and poverty. The transition also allows for establishing medium- and long-term targets for the energy trajectory. In addition, some participants noted that the transition could help level the playing field by creating new opportunities and requiring multidisciplinary skills. One participant stated:

> *Women and girls are starting to outperform men in schools/universities.* JT-PO10

This observation highlighted that with more women qualifying for tertiary education, support, such as targeted clean energy-related bursaries or mentorships could help increase gender equality and inclusion in this transition.

It was also emphasised by another participant that there needed to be:

> *…purposeful mindset changes that men and women could and should be employed in the sector.* JT-PO7

This perspective was supported by the idea that both actual and perceived barriers should be addressed. One approach suggested implementing training programmes that actively attract women candidates. Another proposal was to integrate training programmes for both women and men to foster inclusivity and make men aware of women's capabilities. This diversity and inclusion could add to the innovation and business development of new enterprises. The perception would be new opportunities were not all male dominated. In addition, the recommendation was to develop bridging programmes to unlock women's leadership potential.

Some participants emphasised the importance of women pursuing self-development programmes, seeking mentorship opportunities, and enhancing their self-confidence. Women should learn from men about networking and taking risks in career advancement even if they do not meet all selection criteria.

Many participants believed that expanding professions, jobs, and entrepreneurship would create opportunities for re-skilling individuals into new roles and reduce the perception of energy careers being male dominated. A common view among participants was that the transition to clean energy would provide diverse opportunities beyond traditional male-dominated technical or

economic positions. This transition included opportunities for multidisciplinary skills where there has already been an increase in the participation of women.

This sentiment is reinforced by the following quotes:

> *The beauty of clean energy is that it is seen as being more inclusive of women more easily, better than dirty energy, e.g. coal mining, power generation plants – also in terms of health and working conditions, physical strength required.* JT-PO7

> *It's easier to be inclusive in clean energy since it does not involve as much hard work.* JT-PO9

Some views were less optimistic about the energy transition being able to produce equitable outcomes and were expressed as follows:

> *Not every skill that exists right now is going to be transferable.* JT-PO3

> *Jobs lost will not be replaced like for like or even the same number of jobs.* JT-PO10.

The above comment is particularly pertinent when one considers that jobs and opportunities in coal mining and energy generation are concentrated mainly in Mpumalanga. Whereas new opportunities in renewable energy are being developed largely in other provinces and localities.

4.5.4. Potential impacts on women

Some participants contended that a gender-sensitive and transformative energy transition could offer women access to information, knowledge, and skills development. This would enhance their involvement in decision-making processes and enable them to capitalise on employment or entrepreneurial opportunities, in so doing improving their own lives, and those of their families.

> *Empowering women can also benefit their children due to the significant proportion of single-parent and women-led households in South Africa. Thus, promoting energy justice on the supply side of energy can create jobs and contribute to societal improvements.* JT-PO4

Some participants highlighted that clean energy is perceived as less arduous or dirty work compared to coal mining and coal-fired power stations.

Many suggested that a strategic approach would be to prioritise women already working in the energy or mining industries, who possess foundational skills, be re-skilled or upskilled for the clean energy sector. In addition, women in professions, such as law, finance, human resources, and business development might also benefit positively from gaining knowledge and skills related to the clean energy sector.

For women unable to participate in utility-scale projects, there are opportunities in microgrid energy generation and cooperative business models. This democratisation of energy can create prospects for women in townships and rural communities to leverage business opportunities and access affordable clean energy.

Another positive opportunity for women is illustrated in the following quote:

> *It's a new industry with new technology that's constantly evolving and new products being given. There's no entrenched position that it's just male-dominated. It's almost like an open field vis-à-vis more incumbent industry, right?* JT-PO11

The transition away from coal is beneficial for communities due to improved air quality from reduced carbon and other toxic emissions. This improvement can lead to a better quality of life and a reduction in health issues, such as stillborn births and asthma. While cleaner air benefits the entire community, women often bear caregiving responsibilities and are typically responsible for looking after family members when they are ill.

Some participants highlighted that coal mining had created a thriving informal sector and provided support to many families, which clean energy may not replicate. In addition, South Africa's transition to clean energy has been driven by large-scale projects requiring significant investments. This has attracted wealthy

international investors from traditionally male-dominated sectors, with the possibility of maintaining the status quo.

> *Because of the sheer scale of the plant, people speak in terms of billions of rands which can scare people away. It creates the perception that this is only for the big guys – who tend to be men – who have easier access to the bank managers.* JT-PO9

In some cases, international investors' compliance with socioeconomic development has been superficial. This has led to situations where a black woman was given a percentage of shares but was not permitted or required to contribute to decision-making or operational aspects of the business. There was no genuine investment or interest in empowering women.

Historically, women have not been significant participants in the energy industry. Many lack access to information about the transition to clean energy; even when information is available, it may not be presented in an accessible manner due to its complexity, packaging, presentation or language and literacy barriers. As long as women are excluded from participation, they will remain unaware of the choices or opportunities available to them. They will miss chances to become advocates, entrepreneurs or policy architects. In addition to information, one participant highlighted that

> *Women may also continue to be excluded due to lack of financing or capital which is specially designed for women, lack of ownership of collateral and exposure to opportunities in the energy value chain. JT-PO5*

An alternate negative impact is that the transition encompasses more than financial aspects. It also involves technology, implying that greater opportunities could be achieved with the transfer of skills, knowledge, and technology. The aim would be to develop and manufacture these technologies locally, rather than limiting activities to assembling imported components.

> *There is a need to inspire research and innovation to develop our own technology. We also need to understand that we're taking women from a low base and there are all kinds of investments we need to make to pull*

them up and bring them to a certain level. If we don't intervene, the few will continue to benefit. JT-PO10

Without planning and bold leadership, communities may miss out on benefits from local large-scale projects. Instances include energy infrastructure being used for benefit elsewhere, leaving local areas without the benefits. Though the clean energy transition should benefit the broader economy with just intentions, there are specific challenges for coal regions like Mpumalanga, where job losses in sectors supporting the community, such as teachers, nurses, and shop assistants could be significant if no alternatives replace the coal-based economy.

4.6. Summary

A general view that energy transition is perceived as fair requires an inclusive approach. This approach needs to address historical challenges, be inclusive, and acknowledge that failing to include women will further solidify the triple challenge of poverty, unemployment, and inequality.

In addition, it is recognised that the transition has the potential to change the perception of the energy sector as male dominated. The requirement for multidisciplinary professional opportunities, changing business models, and decentralisation of energy generation provide greater opportunities for gender inclusivity.

Many women, who have been in secondary or indirect jobs created by the coal value chain, are excluded from the transition to clean energy which can affect society and the broader economy.

Given the historical absence of women in mainstream economic sectors, including the energy sector, their inclusion must be intentional and practical. This requires their participation in specially targeted programmes for women's skills development, financial support, and monitoring of employment equity policies.

While both the government and the private sector are expected to play significant roles in promoting target-driven inclusion, a systemic approach is required that includes other role players, such as academia, the broader education system,

and financiers. Achieving gender inclusivity in the energy transition requires visionary leadership and practical operational support.

4.7. Barriers to equal participation of women

4.7.1. Societal barriers

Societal barriers to the participation of women in the JET and other male-dominated industries include socialisation, belief systems, culture and historical factors.

Participants generally agreed that the initial encounter with gender norms and stereotypes occurs during childhood socialisation. The way children are raised by parents and teachers often leads to girls being associated with nurturing and care responsibilities linked to households, which extends to service-related and community roles. Conversely, boys are often prepared for physically demanding work and potential roles as primary earners for their families. These perspectives on gender roles become internalised, contributing to gender bias and affecting individuals' self-perception.

> *Girl children are conditioned to ask for permission, to play it safe and not to be risk takers. So here when you are doing pioneering work in terms of developing a new industry, there's so many unknowns, and we're not raised to lean into the discomfort and do it anyway*. JT-PO11

Ultimately, women end up creating barriers for themselves by yielding to gender stereotypes.

> *Those who do break out of that stereotype for themselves then see other women as competition or opposition and end up not being very supportive of other women.* JT-PO1

To change these perspectives, one of the participants had this to say:

> We need *to change mental models. Especially those in leadership positions. If their outlook is limited to women being in administrative positions and do not have a role in technical positions.* JT-PO5

An observation is that remote work, social media, digitisation, artificial intelligence, mobility of skills, new generational attitudes to the world of work and mental health are among a host of issues which can shift traditional social constructs of gender.

Socialisation is also embedded in culture which shapes certain patterns of behaviour and roles that people assume.

> *Men form alliances and learn how to support each other. They've networked; they've played golf on a Wednesday. Women second guess themselves – you see it in boardroom meetings.* JT-PO1

Several participants mentioned that women are less likely to apply for a position unless they feel highly qualified, whereas men are more likely to apply based on partial qualifications and confidence.

Participants also discussed organisational cultures in male-dominated fields, highlighting issues, such as typecasting women into specific roles, not providing appropriate protective clothing, and occurrences of sexual harassment and gender-based violence. Women are often expected to adapt to the existing culture, which may not support gender mainstreaming. Another perspective that was shared is that

> *Archaic views of women can be held by older men although these views might be changing among younger men. At the same time, there are women who are interested in having families and the workplace must not undervalue that choice.* JT-PO7

The role of culture in society was another factor highlighted as a key contributor to how women are perceived or behave in the workplace.

> *It's been hammered by cultural, by religious beliefs that women must become subservient, must have a man as a head of the household. And*

> *unfortunately, when you get into a place of work where, you know, maybe I am a boss, right, I'm a manager or I'm in charge. And on my team people are reporting to me are males.* JT-PO10

The response above illustrates the contradiction of roles that women face in their multiple roles.

One participant noted that these barriers affect all women, despite their diversity, viewing them as generational and chronological challenges. Another mentioned how historical events like Apartheid have influenced gender stereotypes and role models, particularly for black women.

> *A lot of black women essentially grew up seeing their mothers, grandmothers, aunts, all the women in their families either being domestic workers or in education or healthcare. It then socialises black girls into thinking they must do the same. This is the role model.* JT-PO3

This social service/domestic orientation combines with the experience and burden of care work that women carry which influences women into naturally selecting these types of careers rather than engineering or other technical careers.

Another perspective was the inclination of the government to support male-dominated industries. Although the government might have policies to support gender equality, it has not done well in levelling the playing field for everyone, especially in supportive programmes and initiatives directed at women.

4.7.2. Institutional barriers

Participants highlighted that institutional barriers exist across multiple sectors, including government, education, companies, finance, religion, and traditional communities. The government was perceived by most participants as having a critical role to play in promoting gender inclusion and creating an enabling environment for women to thrive in the economy. Their role was especially

pivotal, given the systemic nature of the problem and the government's ability to intervene.

JT-PO3 expressed the view that the government demonstrated greater support to male-dominated industries and did not do well in levelling the playing field for everyone, particularly women. The government was not perceived to be doing enough to support women who lacked the resources and infrastructure to start-up businesses.

While the government was acknowledged for setting legislative and policy frameworks to promote employment equity and black economic empowerment that included women, it was criticised for not prioritising women's empowerment in a targeted way. The government was referred to as paying lip service to women's empowerment and not reaching beyond numerical indicators of their representation. It was felt that the government needed to engage more deeply and meaningfully with women through targeted programmes monitored for effectiveness and impact. It was suggested that the government should collect data to provide a clear picture of gender issues.

> *That is because of data to give us a real picture or reality on gender issues in the country or the differences between men and women in terms of thriving and how they are affected differently JT-P03*

The education system was also highlighted for not promoting or inspiring girls and women into careers other than the social services stream. The government was once again perceived as having a critical role in shaping the ecosystem for gender inclusion in education. The role of government, as well as that of universities, was in the spotlight in the following responses:

> *Academia has a significant role to play in elevating gender mainstreaming as an imperative for different disciplines and they're not playing that role. There should be gender desks at each university, theory of gender justice should pervade each faculty and programmes that are focused on the technically astute. JT-P05*

A view expressed by another participant reflected the following:

I think transition itself is not changing how universities recruit students or how they employ your lecturers or academics. If they have biases, it's what has always been there historically. JT-P09

Yet another example of referencing universities was cited by a participant who referred to a study published by the Commission for Gender Equality. The report highlighted the rise of sexual harassment in a comparative study of three South African tertiary institutions.

In a further reference to tertiary institutions, academia were identified as having a significant role to play in elevating gender mainstreaming as an imperative for different disciplines and that they were currently not doing so.

The comments made by participants on the role of universities related to the acceleration of the energy transition suggest that tertiary institutions can cooperate in the energy transition and nurturing and advocating a more significant role for gender inclusivity. A strategic focus should be on increasing the intake and throughput of women into various roles in the energy value chain. Universities are well placed to engage in research and innovation, as well as community outreach programmes that could benefit the just energy transition.

Finally, another role that some participants felt could be firmly advanced by the government was that the care economy could be strengthened. Women need to be supported and liberated from the barrier placed before them in their quest to participate more meaningfully in economic opportunities.

Some participants noted that women face financial access barriers that are especially prohibitive. Men, often linked to their racial profile, tended to have easier access to finance, disadvantaging women further.

Companies were also seen as not fully appreciative of the multifaceted roles women play. Participants emphasised the need for companies to be intentional in creating a culture of inclusivity and diversity, starting from top management.

This view is further illustrated by one of the responses:

If there isn't a culture of supporting women, of understanding that women come into the workplace with a whole lot more challenges and baggage, we have families, children, etc, Not all companies are supportive of that be it at government level, private or academia, we need to be intentional at a management level. JT-P01

Another participant argued that the real barriers in the workplace are often invisible and intangible. These behaviours may be expressed as bias, organisational culture, values and beliefs which may work against the empowerment of women. In other incidents, men working in male-dominated environments would claim not to know the boundaries of inappropriate behaviour towards women or what constituted sexual harassment. Often these behaviours resulted in women leaving some of these male-dominated professions or not entering them to begin with.

As suggested by one of the participants, organisations need to create a culture of inclusivity and diversity. Leaders of organisations, including company boards, should lead by example and ensure policies, plans and actions create safer working environments for women.

We need to be creating a culture of inclusivity and diversity, As we manage, we need to eat, live, and breathe it ourselves. If it's not intentional at board level, it won't filter through the organisation. JT-P01

A participant mentioned that the government's role was insufficient if there was no monitoring of employment protection policies. Also, it had to ensure that women received or benefited from opportunities.

Furthermore, the role of government was to ensure gender mainstreaming was embedded in a strategy with every division having a relevant mandate. It was also suggested that some form of recognition be introduced as an incentive throughout the system. The various levels of government, individuals and organisations who introduced programmes and achieved measurable outcomes towards gender mainstreaming should be recognised for their work.

As part of the gender mainstreaming of policies and plans, one of the participants argued very firmly for the need to have gender experts in the room for planning and implementing across the value chain.

It was also felt that attention, by both the government and the private sector, given to building or supporting a care economy placing greater value on the role that care work played in the economy.

To create an enabling environment in the workplace one of the participants, JT-PO7 suggested that **"**decision-makers in the workplace needed to embrace and value the role of motherhood and mothers in the workplace, not just accommodate but embrace this role".

Further recommendations for companies included the formulation and implementation of energy policies and plans that were gender sensitive and based on evidence of data and consultation. Given the possibilities of sexual harassment in the workplace, it was also recommended that relevant training be provided to address gender stereotypes, gender bias and gender diversity and inclusion.

Several participants directed their recommendations at women themselves. These recommendations included learning from men's networking styles, identifying men who could be approached as gender equality advocates or mentors, networking and collaborating with other women, and establishing or joining women-led companies.

Additional recommendations included designing and implementing programmes for women to increase levels of awareness and showcasing businesses or interventions that illustrate women's capabilities.

Participants generally saw the need for systemic change and intentional and transformative leadership from various sectors of society. While the role of government and the private sector has already been articulated, reference was also made to the role of churches and traditional leaders, especially given that these are key pillars that shape culture and belief systems.

A novel view expressed by one of the participants was that engineers themselves must reach beyond to other disciplines. These included the role of social science in enterprise development, local economic development and community engagement and were areas that engineers would not necessarily be good at. The participant also thought that rather than identifying community work as a cliché role for women, more men should do community development work.

The following quotes from two of the participants place their recommendations in the hands of women themselves, as well as broader society. They encourage women to take responsibility for their own development whether through education and training programmes, networking or soliciting the support of mentors or coaches. Participants also encouraged continuous dialogue to shift mental models and social constructs.

> *Attention should be given to promoting emotional intelligence, helping women in how to present themselves, how to deal with men, how to leverage softer skills.* JT-PO6

> *Keep talking, having conversations to build bridges, demystify between young and old, women and men, girl child and boy child.* JT-PO7

4.8. Summary

The barriers that women face in attaining gender equality are pervasive across society, institutions, culture, religion and both external and internal belief systems. Some of the participants aligned with the notion that women are best suited to playing service and nurturing roles. It was argued earlier by one of the participants that if women choose to honour their role as homemakers and child bearers, this should be respected and supported by the government and their employers.

On the other hand, many argue against gender inequality and the abuse of women based on societal norms and institutional barriers. This study is an attempt to acknowledge the significance of gender inclusivity for the benefit of economic growth and socioeconomic development because women are significant victims of poverty, inequality and unemployment.

Both the recent acceleration towards a just energy transition and the perception that clean energy offers a new suite of opportunities that are more conducive to the inclusion of women. It requires a multi-disciplinary approach that can benefit from the unique skills and roles that women bring to transformative business.

Gender inclusivity requires intentional leadership across sectors of society considering that gender inequality is systemic and entrenched by historical, societal and institutional barriers. Beyond, rhetoric, an intentional approach, requires various strategies including targeted, transformational and measurable interventions directed at women and girls that level the playing field for the inclusion and retention of women. Continuous dialogue is also suggested to address intangible issues that reside in bias, stereotypes and organisational culture.

5. DISCUSSION ON FINDINGS OF THE STUDY

5.1 Introduction

This chapter discusses the findings presented in Chapter 4 in response to the research objectives explored in this study. This study had the following objectives:

1. Explore South Africa's transition to clean energy within the framework of a just transition
2. Investigate the concept of gender inclusivity in South Africa's just transition to clean energy
3. Identify and examine the barriers to gender inclusivity in South Africa's clean energy transition

Based on the application of energy justice theory and the adapted engendered energy justice conceptual framework (Figure 2.3), this discussion reflects on how the findings contribute to the idea that the energy transition could advance gender inclusivity in South Africa. It also integrates analysis or reference to secondary data drawn from JET processes underway through the PCC and presents a conclusion of the findings.

5.2 South Africa's transition to clean energy

While South Africa has developed its own Just Transition framework which shares similarities with energy justice and the engendered justice conceptual framework, adapted by the author, the findings of this study highlight synergies as well as areas that need strengthening that could enhance Gender inclusivity towards a just energy transition in South Africa.

5.2.1. Understanding justice

It has been mentioned that the pronouncements from the Paris Accord of 2015, as well as the publication of the Sustainable Development Goals of 2015, supported the ideals for a just process in mitigating climate change. South Africa's JET framework under the PCC has drawn significantly from the ILO definition of a just transition which is people-centred, rights-based, as well as gender-responsive and inclusive. (ILO, 2015)

In essence, the intentions espoused in the just transition framework for South Africa seek to achieve a quality life for all, foster climate resilience, and reduce carbon emissions towards net zero while contributing to decent work for all, social inclusion and eradication of poverty. It also seeks to include those most likely to be impacted by the transition, in decision-making, and concludes with the objective of a more resilient economy and people. Furthermore, the goal includes decentralised and diversely owned renewable energy systems that conserve natural resources and promote equitable and inclusive access to resources and benefits while eliminating harm to health and wellbeing (PCC, 2022).

In this critical discussion of the findings of this study, it is important to reiterate the definition of energy justice on which this study is premised. Energy justice can be defined as an approach to energy that is based on the core tenets of distribution, procedural and recognition justice (Heffron & McCauley, 2017) which is applied across the energy system and the energy life cycle (Heffron & McCauley, 2014). It is also based on Sovacool's eight principles previously mentioned (Sovacool et al., 2016). Much as the South African adoption of the JET framework is lofty, it does need the grounding that the integration with the energy justice framework would provide.

(Hoffman et al., 2021) argue that since the REIPPP was launch in South Affrica, the experience of utility scaled renewable energy projects worth significant investments, have flouted public participation or meaningful engagement with local and regional actors, thus reinforcing the centralisation of socio-political and economic power. This begs the question of whether the just energy transition has not already been undermined before it has started. One of the participants alluded to this phenomenon, where international investors had no interest in equity issues and were inclined to window-dress local economic empowerment.

The coupling of the energy justice framework with South Africa's just transition framework addresses a complex issue systemically and comprehensively that looks beyond the plight of workers losing their jobs but instead provides a multidisciplinary and interdisciplinary approach to addressing an economy-wide challenge in a just manner. The energy justice framework and engendered energy justice framework provide additional framing to enhance policy implementation.

Most participants in this study agreed that the energy transition should be human-centred and just, particularly in South Africa which carries a historical burden of injustice and inequality.

The extent of agreement and definition of justice by participants was influenced by varying perspectives, dependent on the constituencies they represented and their personal identities or ideologies. Those who argued with a social justice or human rights lens, favoured a bottom-up approach informed and led by communities, workers and all who would be categorised as marginalised or vulnerable. They argued more robustly for issues, such as procedural justice in terms of extensive consultation and decision-making processes, distributive justice in terms of equal sharing of benefits and harm, and restorative justice for those who would suffer unintended consequences from the transition. There was also concern about how the energy transition would impact communities in issues of access, affordability and energy security which are among the energy justice principles advocated by (Sovacool et al. 2016).

(Sovacool, et al., acknowledge that justice is often tied to moral dilemmas. Some believe justice is inherently tied to law and orders made by judges or authorities, and others think it concerns individual liberty, allowing citizens to pursue their desires. Modern ideas of justice often emphasize fairness, aiming to create fair social structures for distributing goods and services. Ultimately, ‘justice is important for what it is than what it does”. (Sovacool, et al., p. 436)

Most participants were less vocal in perceiving energy justice as a system and how one component of an energy source or related activity or event impacted the system. This might be indicative of the fact that more work needs to be done to build and communicate a clear and coherent vision and strategy together with the broader society.

While the JET aims to apply the principles of procedural, redistributive and restorative justice, the focus of most engagements reflected on their website is largely technical and procedural. (Heffron, 2022, p.1) reports that countries who signed up to the Paris agreement and SDGs in 2015, are now being held legally accountable. “The rules of the game are being transformed and increasingly all energy activities have to be accountable to how they impact upon human rights or action will happen through legal institutions that protect these human rights”. While recognising that energy justice is time-consuming and resource intensive, it remains a necessary process to avoid social unrest or litigation that might sew distrust in the future and halt project development and investment.

(Heffron, 2022) identifies mechanisms to support energy justice: (i) environmental impact assessments and post-acceptance monitoring, (ii) a social licence to operate with local community cooperation throughout the energy infrastructure's lifespan, and (iii) an energy financial reserve obligation demonstrating a company's capacity to clean and restore infrastructure at its end (Heffron & McCauley, 2017, p.661). Notably, no participants mentioned externalities affecting communities near energy generation sites. Although, this sample comprised of experts, it is clear that the nature of stakeholder engagement needs to move beyond the number of stakeholders it has consulted on technical issues but also ensure that a shared understanding of justice is developed so that

stakeholders are meaningfully engaged in how they can benefit or avoid harm through the entire lifecycle of energy projects.

These are important considerations to include in ensuring procedural, distributive and restorative justice which both government and the private sector need to account for. More importantly, they provide safeguards for the communities. These considerations can lead to reduced costs of any health effects and a negative impact on other sectors of the economy. Once again, it also points to the need for additional lenses other than those of engineers and economists.

Some participants lauded the government for their leadership under the President's Climate Change Commission, though they felt the PCC could do much more to reach broader society. As already indicated, although the PCC has put much effort into its consultation processes which are transparent and accessible, concerns about procedure and approach were raised in their Energy Poverty and Green Hydrogen stakeholder dialogues. (PCC, 2023).

Other KIIs were concerned that the government was not doing enough to reach out to all corners of society and all spheres of government, particularly local government. Despite the JT framework being launched in 2021, the first countrywide engagement with local government was held in November 2024. While this might have been an issue of timing, local government is a critical stakeholder in the energy transition both as an implementer and because of its dependence on energy revenue streams. (PCC, 2025)

Finally, a note of caution was sounded by one of the participants about using the JET as a panacea for all injustices in the country. A distinction was made between the plight of Mpumalanga where over 80% of the country's energy is generated, and other areas in the country where clean energy provided new opportunities (PPC, 2022). A contrary argument to this perspective though, is that while Mpumalanga has been the primary source of coal and coal-fired power generation, it has serviced the needs of the entire economy. Mpumalanga paid the price of poor air quality and accompanying health implications, the impact on its water resources, as well as benefits to the secondary industries and communities established on the back of the coal industry. This is an example of

how energy justice encourages systems thinking in its approach to energy systems. “Energy policy often deals with only one section of the energy system to the detriment of its overall effectiveness. Thus, more pronounced systems thinking is needed”. (Jenkins, 2016, p.179)

While there is merit in having different perspectives, it is clear even from this small but significant sample that there is a need for a shared understanding of what justice means so that different voices can be heard, benefits are equally shared, and opportunities are created across different sectors of society. Responses also spoke to the need to address the complexities and nexus between energy and people, economics and power, demographics and process and the need to consider all aspects of justice.

Those participants who argued with a more economic or technological lens were concerned about the perceived injustice of conforming to international barriers to trade through carbon border adjustment (CBA) taxes which were likely to be imposed by developed economies. This was viewed as a form of cosmopolitan injustice where developing countries were still on an economic development trajectory and could not be compared to developed economies, which are highly industrialised and responsible for the highest emissions (Heffron, 2022).

(Heffron et al, 2018) recognises that the global transition is difficult as it is challenged by competing philosophies and interests. However, they still argue that the just transition is a more inclusive approach that involves a variety of stakeholders and there is a need to debate, discuss, research and apply the just transition using an inclusive approach.

5.2.2. Transition to clean energy

Ultimately, a just energy transition is “a fair and equitable process of moving towards a post-carbon society. This process must seek fairness and equity with regard to the major global justice concerns, such as (but not limited to) ethnicity, income, gender within both developed and developing contexts” (McCauley & Heffron, 2018, p. 2).

While most participants acknowledged the need to address climate change, there was a common view that the drive to transition to clean energy was likely to further

suppress economic growth and have far-reaching negative socioeconomic impacts. There was a need for the country to counterbalance its loss against potential gains and manage its climate obligations alongside its development objectives. The just transition framework adopted by South Africa lists three key value chains at risk besides the coal value chain. These include the automotive, agricultural and tourism value chains, all have been significant job creators. (PPC, 2022, p. 10). The tourism and agricultural sectors are of concern as high emitters but also relevant as key alternative sectors in Mpumalanga when considering the energy system is under serious threat by the transition.

Generally, most participants were initially critical of how the transition had been managed. There was an emphasis on the transition being slow, erratic, disjointed, not intentional or strategic and not sufficiently long-term in its vision. Corruption was one of the reasons cited for the delay. While some argued that the transition began with the launch of the JT at COP 26 in 2021, others argued that the transition had begun much earlier through voluntary private sector initiatives with attempts to promote energy efficiency and reduce carbon emissions.

While the first REIPPP was launched with much fanfare in 2011, renewable energy still only contributes about seven per cent to the grid almost fifteen years later. There were questions raised about why there was not more collaborative planning that would have ensured that the expansion of transmission and distributive networks were aligned with new project developers. Some views shared that the large international investors in renewable energy had not been held accountable for their commitment to socioeconomic development or the principles of a just energy transition. Heffron (2018, p. 76) argues that “the application of justice in the energy sector has clearly been a forgotten issue, and the dominance of economics and big energy companies may explain why it was not a feature until recently”. The perceptions of incoherence, disjointed planning and lack of accountability among some firms, highlights the need for one of the principles proposed for energy justice – good governance (Sovacool et al., 2016)

Participants applauded the significant acceleration of the transition following the launch of the JET partnerships and the development of JET structures and

programmes under the presidency. However, there was still a view that the broader society was unaware of the JET and that there should be more communication and an inclusive approach.

Some participants reflected on competing vested interests and the need for bold and courageous leadership. Not only is this fundamental to leading and guiding the complexities of the transition in the context of competing priorities but in the light of manifold geopolitical shifts across the world which can impact funding and investor commitments, governance and support of climate change ambitions and global threats to energy security.

Since its establishment in 2021, the PCC can be commended for putting various structures in place under leadership of the president, supported by relevant members of cabinet, technical experts and extensive engagements and multimedia communication with stakeholders. Yet, despite its intentions and extensive activities toward promoting a Just Energy Transition, there are several gaps that will be identified in this discussion.

While the PCC has hosted numerous engagement platforms with an array of stakeholders, ranging from webinars, training, reports and community engagements, a review of the reports and recordings of its various engagements illustrates an emphasis on procedural justice which is concentrated more on sharing information than inclusive participation and decision making. Situated within the broader context of climate change, engagements on energy become superficial especially given the level of complexity of the subject matter. Much of the content is delivered through power point presentations and is highly technical and therefore, compromises active participation and decision making.

So, while the PCC is at the forefront of ensuring a just process, there is more depth required in attaining the full extent of the just principles it wishes to fulfil. (Sovacool, et al., 2015) breaks justice down to four things, access to information, access to and meaningful participation in decision making, lack of bias on the part of decision makers and access to legal processes for redress. These are criteria worth looking at throughout the transition process.

5.2.3. Professional requirements

Among the reasons that this study explored the professional or job requirements of the energy transition, was to assess the potential job losses that could occur in the traditional energy sector, the opportunities for re-skilling and upskilling and potential opportunities for gender inclusivity in the new work environment.

Once again, participants who used a technological and economic lens, saw new opportunities in the transition to clean energy. It was admitted that in some instances the clean energy value chain might not be as labour-intensive as the coal value chain but there was a benefit of transitioning to clean energy. Clean energy could reduce the energy security challenge and in so doing, bring greater economy-wide stability and open new corridors of opportunity and access to markets for other sectors.

Pioneering projects in the clean energy sector had tended to be largely at the utility scale, requiring significant investment and technical capability. Some participants attested to opportunities that the transition opened for multiple disciplines including professions that might be more attractive to women. Participants were under no illusion that jobs would be lost in the transition from fossil fuels to clean energy. Much collaboration was required between the government, the private sector, universities and vocational training institutions to ensure a healthy pipeline of skills for existing and new clean energy development.

A significant point made through this study was that the government needed to mirror the skills in the private sector to stimulate an enabling environment and produce, implement and monitor their supporting policies and plans.

One of many implications relating to new or revised professional requirements is the financial and human resources required, not only to equip people with new skills but also project management skills to plan timeously for various phases of the transition.

It is also important in line with energy justice theory, not to envisage this as only a technical transition but one that requires the skills that simultaneously address socioeconomic imperatives.

A further implication is that the work to execute the transition is likely to be done by traditionally dominant or established businesses/institutions. This could disadvantage small businesses, unskilled and marginalised institutions and inexperienced people who don't have the required capital, requisite skills and human resources to enter this market at the onset. Since women are likely to fall into the category of small businesses and may not have experience or extensive balance sheets for funding, strategies to overcome this barrier are necessary.

5.3. Advancing gender Inclusivity

5.3.1. Gender Inclusivity

Using an energy justice lens, a common challenge experienced globally is the inadequacy of sex disaggregated data to determine where women are placed in the economy, especially in the energy sector. Gender inequalities are often unapparent for policymakers due to the lack of gender disaggregated data on energy use and energy needs (Pueyo, 2020). (Allen et al. 2019) argued that the lack of sex-disaggregated data is a key reason for the feminisation of energy poverty not receiving sufficient attention. This would also impede soliciting the participation of women if they cannot be easily identified or located.

Using McCauley's three tenets of procedural, distributive and recognition justice, it may be argued that despite over thirty years since the Beijing Declaration and Platform for Action for women's rights, women remain in the domain of the marginalised and vulnerable categories of broader society and the mainstream of the economy. (McCauley, 2013)

Wood (2023, p. 3) refers to "malrecognition" when certain people are rendered invisible, disrespected or dismissed in contributing to policies aimed at correcting "maldistributions" of resources or benefits. Another example of "malrecognition" is the oblivion of seeing women as a grouping because of their gender role. They need to be included in participation and decision-making roles, acquire opportunities, be informed and understand the benefits and harm associated with the transition. Women are already victims of "malrecognition" by not being equally represented in the conventional energy sector. Therefore, decisions and policies culminate in being gender-neutral or gender-blind. Women may be excluded from

participating in decision-making meetings due to a lack of transport, money, computer access, data for virtual meetings or language barriers.

Nevertheless, the National Development Plan (NDP, 2030) and the Just Energy Transition Plan (PCC, 2022) have advocated for the role of women's participation in the green transition to attain a more active role in the economy as professionals and entrepreneurs. However, (Heffron et al. 2017) emphasize that there is insufficient focus on how energy justice frameworks are implemented in practice. This includes the creation of equitable energy policies and achieving fair outcomes from energy policy interventions. Even where equitable policies do exist, the ability to implement and monitor outcomes in accordance with those policies appear to be absent.

While some participants still locate gender considerations with households, care work and service-related work, other participants argued optimistically about women's empowerment and participation in the energy transition and the broader greener economy. While unconscious gender bias was the subtext of some of their responses of what would be considered women's work versus men's work, there was a greater receptivity to engaging on issues of gender equality.

Participants saw greater opportunities for women in the clean energy environment in professions not labelled as male dominated.

However, beyond the possibility that there was greater scope for women to participate more actively in the clean energy space, barriers still need to be eliminated.

For as long as women remain outside the industry or unorganised in formal platforms, their opportunity to share perspectives, engage in decision-making and participate equally as women beyond their intersectional differences, they will continue to be excluded. Several participants felt that it was the role of the government to take more decisive steps in gender mainstreaming strategies and actively support them with training, financial support and targeted approaches to women empowerment. (Jenkins et al., 2016) argue that while energy justice is a global concern, there is a need for policy interventions to ensure energy solutions that are contextually embedded. Given, the undertaking made by the South

African government towards the gender mainstreaming and the economic empowerment of women, the PCC would be expected to gender mainstream its activities as it progresses.

5.3.2. A gendered lens to the transition to clean energy

(Feenstra et al., 2021) found that scholarly literature on energy and gender still focus on the household level, where women carry the burden of energy poverty. They further assert that conceptual frameworks and empirical evidence of the analysis of macro-level energy policy through a gender lens remains scarce. Such scarcity of scholarship on this subject is despite work by Parikh (1995) who contested the emphasis on the household level for four reasons. These included the fact that (i) women's roles extend beyond the household through their work in agriculture, food processing, service and manufacturing, (ii) households are not a homogenous entity in the allocation of time and resources between genders, (iii) women are both energy users and participants of the energy supply chain, and (iv) women have diverse roles in designing, adapting and using new energy technologies. It is with this argument in mind that the engendered conceptual framework, ***Figure 2.3***. is used to discuss the study's findings further.

The core tenets or "triumvirate" of distributional justice, procedural justice and recognition justice (McCauley, 2013), and the eight core principles of (Sovacool et al., 2016) provide a distillation of frameworks underpinned by restorative justice together with cosmopolitan justice. These provide the basis for decision-making and practice in dealing with the energy system through its life cycle of activities (Heffron & McCauley, 2014).

The engendered energy justice conceptual framework provides a gender lens through which to analyse the study's responses to the remaining gender issues. In using the framework, it proposes that issues of energy justice as experienced by women, should be filtered through a gender lens which in effect is part of gender mainstreaming and could be applied across genders. Using the gender lens, gender consideration could be viewed not only against the justice principles advocated in ***Figure 2.2.*** but also consider women's perspectives based on context, temporal and special factors. (Fuller et al., 2016) conducted a case study

which looks at the framing of energy justice and focuses especially on the sites of production and consumption and how they relate especially to the tenets of procedural and distributive justice. Based on their framing, questions around where production occurs in the energy system in relation to where it is consumed matter. For example, if an energy plant is built in a particular site, what are the impacts or benefits for the community in which production occurs? Apart from the application of a gender lens, how women are impacted should also take cognisance of the following:

- **Context:** This could include intersectionality, such as race, language, location, (rural, urban, township), relationship with energy consumption, employed or unemployed or social, cultural, economic and political contexts. Concerning the energy transition, the opportunities or impact would be different in Mpumalanga where coal-fired power stations are in the process of being decommissioned versus the coastal areas where wind and solar energy are part of the current transition.
- **Temporal:** This could include how a woman's time is spent and whether she has time to spend on economic activities. It could also be at what phase of the energy transition she might be exposed to and what the impacts or opportunities are in relation to time. An example would be at what phase of the development the energy transition is or when it is likely to begin or end in its lifecycle?
- **Spatial**: This refers to physical space and geographic location. The relevance of this lens is if located close to employment opportunities, hazardous waste, proximity to the energy source and whether any of these factors present risks, opportunities or threats. If one were looking at consultation processes with women, such factors would be useful for arranging public consultations or exploring possibilities for social research, by way of an example.
- **Value chains**: An understanding of which part of the value chain presents opportunities or impacts that must be considered.
- **Energy justice tenets** and principles underpinned by restorative justice

5.3.3. Potential impacts on women

This study highlighted both the positive and negative impacts of an energy transition. Reference to women continues to be associated with household responsibilities, care work, energy access and energy affordability issues related to impacts. The conceptual framework allows for greater specificity about the positive or negative impact that women would be exposed to. The framework can provide analytical data in appropriate forms of participation, interventions or solutions.

5.4. Barriers to equal participation of women

5.4.1. Societal barriers

While the study highlighted the societal barriers that women face rooted in gender norms, religious or cultural beliefs and historical factors, it was apparent that women are unique in how these factors affect them. If women are beginning to excel at tertiary institutions or have access to networks and partnerships, their plight would be quite different from women in a rural village who might not have land ownership rights or be able to participate in the development of small-scale solar production through recent democratisation of small-scale energy generation. According to (Feenstra, 2021), early gender mainstreaming efforts lacked a theoretical basis for fair energy distribution. The energy justice discourse addresses this gap by exploring the equitable distribution of energy-related costs and benefits linked to power, status, and governance. It can also assist in eroding the societal barriers that exist by adopting its principles and tenets.

5.4.2. Institutional barriers

Even though the government has policies to support gender equality, this study revealed that the government is expected and is perceived to have the power to do much more. The view is that the government may have suitable policies but does not do enough to enact or enforce the plans. Plans are inadequately monitored or evaluated for impact. The government also does not identify synergistic relationships with other relevant government departments or other spheres of government with which to collaborate to achieve its goals.

Examples of potential collaboration include effective partnerships with basic and social development services to support women in some of their care responsibilities, and particularly to allow for greater economic activity among women.

The government also influences tertiary institutions through targeted bursaries and curriculum advocacy, directed at a higher intake and retention of women in more STEM-related career paths. Universities together with the government could encourage research of gender issues, particularly in areas that promote the economic empowerment of women. With specific reference to energy justice, there is scope to encourage further research of the Global South, including a focus on gender-related issues that explored the industrialisation of women, as well as a macro policy perspective.

The private sector was identified as shrugging off its responsibility toward the recruitment and retention of women, as well as not having protective policies and plans to protect or support women from sexual harassment in the workplace. Organisational culture in many companies was perceived as not acknowledging that women occupied a multiplicity of roles and was a likely deterrent to women entering certain professions.

Finally, there is a view that the government could do more to support women in accessing finance, particularly with development finance.

Rather than focusing on punitive measures, it was proposed that the government reward or incentivise institutions that recognise the voice and contributions of women in the workplace or the economy. These are important points to be considered to ensure a just energy transition.

(Feenstra et al., 2021) propose a framework for developing equitable energy policy that integrates various methodologies from gender-energy nexus research. This framework synthesizes concepts from multiple disciplines and is adaptable to different contexts. They in fact, encourage multiple frameworks to analyse a particular problem on the basis that people make different assumptions about the nature of the problem in particular contexts. They add that frameworks which explain the same issues can co-exist and depending on the context, one

framework or elements of that framework may be more applicable. Hence, the engendering conceptual framework provides an overlay on the Energy justice framework presented in ***Figure 2***.

5.4.2. Addressing barriers

While it has already been stated that there may be many barriers holding women back including their own lack of self-confidence or reluctance to take risks, the argument is still valid that women bring a new set of skills to the workforce and are significant in enhancing economic competitiveness (Ostry, 2018).

It is, therefore, incumbent on the government and the private sector to assume responsibility for alleviating several barriers. One measure suggested was through gender mainstreaming.

Gender mainstreaming was defined by the United Nations in 1997 as “the process of assessing the implications for women and men of any planned action, including legislation, policies or programmes, in all areas and at all levels”. Given the discussion on the injustices that women endure, including recognition justice, procedural justice and distributive justice, the government has a crucial role to play in advocacy and implementation of measurable plans directed at women. One challenge is that a gender mainstreaming national policy takes time, and needs political commitment and institutional support for its development and implementation (Clancy et al., 2020).

It is also useful for the government to become more involved in the value chain of various industries so that women’s economic participation is tracked throughout the value chain of a business.

It was identified that women in the private sector lacked self-confidence. A deterrent to stay in a job was often tied to the organisational culture. Companies needed to move beyond policies to the implementation of measures and strategies to identify and deal with unconscious bias and intangible acts of sexual harassment and Gender Based Violence (GBV).

The need for continued leadership and dialogue is imperative to harness collective and systemic approaches to advancing a long-term energy future that

is just both in line with the just energy transition framework and the energy justice framework.

5.5. Table 5.1. Summary of findings

Research Questions	Summary from Findings
1. **Explore South Africa's transition to clean energy within the framework of a just transition**	• A transition to clean energy is underway though more public awareness and deep engagement is required • The drivers include the need to reduce carbon emissions and respond to energy security challenges • The transition was initially very slow but has accelerated over the past 3 years • A just transition framework was published in 2021 under the PCC led by the president and has led to the Just Energy Implementation and Investment Plan • JET structures are in place and funding is disseminated for the project. However, the wider society is generally unaware of the JET
2. **Investigate the concept of gender inclusivity in South Africa's just transition to clean energy**	• The importance of the participation and inclusion of women in the energy transition is noted in the NDP and the JT framework • There has been little engagement directed particularly at women on the just transition • Professional requirements in clean energy are likely to attract more women • The research revealed a more positive stance on opportunities for advancing gender inclusivity provided that barriers could be addressed
3. **Identify and examine the barriers to gender inclusivity in South Africa's transition to clean energy**	• Women are faced with societal and institutional barriers • The Just Energy Transition could assist in advancing gender inclusion based on the principles of their framework and the incorporation of the energy justice framework

	• Although these barriers are experienced in many settings, the government and business are key to leading dialogue and structural change to address justice for women in the energy sector and across society

6. CONCLUSION AND RECOMMENDATIONS

6.1. Introduction

This chapter offers conclusions based on each proposition. The conclusions are drawn from the composite literature review as well as the rich and diverse inputs made during this study. It also includes recommendations emanating from this study and offers recommendations for further research.

6.2. South Africa's transition to clean energy

This study has illustrated South Africa's overdependence on coal which is the basis for its energy needs and economic competitiveness. Despite its very poor economic performance over the past 20 years as well as the unrelenting triple challenge of poverty, unemployment and inequality, South Africa recognises that failure to honour its global commitment to reduce its carbon emissions will further undermine the economy from a trade and competitiveness perspective. As a country, South Africa has already experienced the impacts of climate change and therefore, acknowledges its role in contributing its fair share to abatement measures though these are conditional on receiving technical and financial support.

While this transition will no doubt have unintended consequences, the use of a Just Transition Framework will assist in ensuring a just process and outcomes to the extent that this is possible. If implemented effectively, the Just Transition Framework can simultaneously seek to address the triple challenge. This study has also argued that the addition of an energy justice framework will provide further support to the JET framework and will enhance the transition to green energy in a manner that is just, sustainable and addresses current inequalities.

6.3. Advancing Gender Inclusivity

The commitment made through the Just Energy Transition Framework is that no one should be left behind. Since one of the primary focus areas of the just transition is directed at the coal value chain, primary concern is directed at workers, industries and communities attached to the coal value chain and related sectors. Given the recent energy challenges, South Africa needs to diversify its energy mix. Recent energy and climate legislation has allowed for the acceleration of the transition.

Given the high levels of unemployment among women and youth and the fact that women are excluded from key economic sectors including the energy sector, failure to address gender inclusion will mean that over 50% of the population will be left behind leading to continued inequality, unemployment and poverty. Considering that many women in South Africa are primary breadwinners and care givers, their continued disadvantage compromises the foundations of their children's future. While gender inequality is not unique to South Africa, the country nevertheless needs to present its own blueprint on how to manage the transition while simultaneously addressing its many other challenges.

The transition to clean energy does offer opportunities for re-industrialisation. It also offers a new set of professional opportunities that women can access with an appropriate enabling environment. Several women are already demonstrating leadership in the clean energy space who can ultimately serve as role models for other women. The energy justice lens also encourages a move away from seeing energy through a purely technological or economic lens and encourages a multidisciplinary and interdisciplinary approach that will afford opportunities for women to play roles which they are already comfortable with or through re-skilling and upskilling or can move into completely new careers.

6.4. Barriers to equal participation of women

This study acknowledged that there are numerous barriers that women face. Some of these can be addressed through advancement programmes. As proposed through this study, there are women who are already in the system,

occupying positions in the coal mining and utility sectors, which can be the first cohort for re-training or upskilling for the energy transition.

The study has also highlighted the societal and institutional barriers which require structural shifts or alteration of mental models. These barriers are more difficult to eradicate since they are rooted in bias, hence it requires concerted efforts by government and the private sector, together with other social partners, to contribute to national dialogues on issues such as gender equality, GBV and overcoming other barriers to equitable participation and opportunities.

6.5. Limitations

- Inadequate scholarship on energy justice in the Global South
- Lack of representation from civil society
- Insufficient peer reviewed journals on examples of women in macro energy opportunities

6.6. Recommendations

Based on this study and its findings, this section offers several recommendations that are deemed useful and necessary to ensure that the Just Energy Transition is indeed just and that women become a recognised participant and beneficiary of this transition.

- **Government to consider integrating an energy justice or engendered conceptual framework in its Just Energy Framework**

The integration of these frameworks will assist in managing the energy transition in a manner that considers energy as a system which requires a systems approach and a greater coherence in effecting the transition and ensuring social justice

- **Development of a long-term energy vision and strategy**

It is important to develop a vision for South Africa's energy future both as an end and an enabler. The long-term strategy will be enabling the setting up of

significant milestones which should have clear targets and indicators. Such a strategy can reprioritise sectors and plan for a pipeline of requisite skills requirements. The strategy should also take stock of what is happening in the global system. This strategy needs the buy-in of society at large and continuous awareness raising.

- **Gender mainstreaming**

This study focused on the transition to clean energy, but a gender mainstreaming approach needs to be developed for all sectors of society. Gender Mainstreaming should move beyond policies into practical, impactful and measurable activities

- **Introduction of energy justice to tertiary institutions**

Energy Justice theory is still a relatively new body of work which was introduced in 2013 though it is built on the base of climate and environmental justice. It was introduced at a time when South Africa had just begun introducing renewable energy into its energy mix. In 2015, the concept of a just transition was further popularised by the Paris Accord and the launch of the Sustainable Development Goals. Most of this research has been conducted by the Global North. It would be useful to have more work published by the Global South. It would also be useful to encourage the practice of multidisciplinary and interdisciplinary teams to foster greater collaboration and sharing of perspectives.

6.7. Areas for further research

- Energy consumption patterns among young people inclusive of all gender orientations
- Participation and experience of women in macro energy activities
- Case studies and participant observation of women leaders/entrepreneurs in clean energy
- Energy Justice lessons from Mpumalanga
- Case studies of the nexus of Gender and Energy Transition
- Gender participation in Energy value chains
- The role of Tertiary institutions in the energy transition

REFERENCES

Abram, S., Atkins, E., Dietzel, A., Hammond, M., Jenkins, K., Kiamba, L., Kirshner, J., Kreienkamp, J., Pegram, T., & Vining, B. (2020). Just transition: Pathways to socially inclusive decarbonisation. Paper presented at the COP 26, Glasgow. https://www.ucl.ac.uk/public-policy/files/cop26_just_transition_policy_paper_final_.pdf

Afrobarometer. (2023). South-Africans-want-greater-government-initiative-to-promote-gender-equality. https://www.gov.za/news/speeches/president-cyril-ramaphosa-womens-day-2023-09-aug-2023

Allen, E., Lyons, H., & Stephens, J. C. (2019). Women's leadership in renewable transformation, energy justice, and energy democracy: Redistributing power. Energy Research & Social Science, 57. https://doi.org/10.1016/j.erss.2019.101233

Boserup, E. (1970). Present and potential food production in developing countries.

Bouzarovski, S., & Simcock, N. (2017). Spatializing energy justice. Energy Policy, 107, 640-648. https://doi.org/10.1016/j.enpol.2017.03.064

Bowen, G. A. (2009). Document Analysis as a Qualitative Research Method. Qualitative Research Journal, 9(2), 27-40. https://doi.org/10.3316/qrj0902027

Braun, V., & Clarke, V. (2012). Thematic analysis. In APA handbook of research methods in psychology, Vol 2: Research designs: Quantitative, qualitative, neuropsychological, and biological (pp. 57-71).

Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. Qualitative Research in Sport, Exercise and Health, 11(4), 589-597. https://doi.org/10.1080/2159676x.2019.1628806

Brown, N. (2022). Research ethics in a changing social sciences landscape. Research Ethics, 19(2), 157-165. https://doi.org/10.1177/17470161221141011

Carley, S., & Konisky, D. M. (2020). The justice and equity implications of the clean energy transition. Nature Energy, 5(8), 569-577. https://doi.org/10.1038/s41560-020-0641-6

Caywood, K., & Darmstadt, G. L. (2024). Gender mainstreaming at 25 years: Toward an inclusive, collaborative, and structured research agenda. J Glob Health, 14, 04011. doi:10.7189/jogh.14.04011

Celeski, E. W. (1995). From Rio to Beijing. Engendering the energy debate. Energy Policy, 23(6), 561-575. Retrieved from https://pdf.sciencedirectassets.com/271097/1-s2.0-S0301421500X00146/1-s2.0-0301421

Clancy, J. S. F. M. (2006). How to Engender Energy Policy. https://www.researchgate.net/publication/238664050_How_to_Engender_Energy_Policy/link/54f5ca790c

Clancy, J., & Feenstra, M. (2004). How to engender energy policy: A technical briefing paper prepared for ENERGIA. https://www.researchgate.net/publication/238664050

Clancy, J. S., & Mohlakoana, N. (2020). Gender audits: An approach to engendering energy policy in Nepal, Kenya, and Senegal. Energy Research & Social Science, 62. https://doi.org/10.1016/j.erss.2019.101378

Cohen, L., Manion, L., & Morrison, K. (2007). Research methods in education (6th ed.). Routledge.

Commission for Gender Equality. (2010). CGE South Africa Beijing Declaration. https://static.pmg.org.za/15

Constitution, S. A. (1996). Bill of rights. *Retrieved November*, *12*, 2013.

Creswell, J. W. (2007). Qualitative inquiry and research design: Choosing among five approaches (2nd ed.). Sage Publications.

CSIR. (2023). Statistics of power in SA 2022-CSIR-[FINAL]. Retrieved from https://www.csir.co.za/csir-statistics-power-sa-2022-final

DFFE. (2021). South Africa updated first NDC September 2021. Retrieved from https://unfccc.int/sites/default/files/NDC/2022-6/South%20Africa%20updated%20first%20NDC%20September%202021.pdf

Dincer, I., & Acar, C. (2015). A review on clean energy solutions for better sustainability. International Journal of Energy Research, 39(5), 585-606. https://doi.org/10.1002/er.3329

Elo, S., Kääriäinen, M., Kanste, O., Pölkki, T., Utriainen, K., & Kyngäs, H. (2014). Qualitative content analysis: A focus on trustworthiness. SAGE open, 4(1), 2158244014522633.

Feenstra, M., & Özerol, G. (2021). Energy justice as a search light for gender-energy nexus: Towards a conceptual framework. Renewable and Sustainable Energy Reviews, 138. https://doi.org/10.1016/j.rser.2020.110668

Forum, W. E. (2024). WEF Gender Gap Report 2024. Retrieved from https://www.weforum.org/publications/gender-gap-report-2024

Fraune, C. (2016). The politics of speeches, votes, and deliberations: Gendered legislating and energy policymaking in Germany and the United States. Energy Research & Social Science, 19, 134-141. https://doi.org/10.1016/j.erss.2016.06.007

Fuller S, McCauley D. Framing energy justice: perspectives from activism and advocacy. Energy Res Soc Sci 2016. https://doi.org/10.1016/j.erss.2015.08.004.

Greener, S. (2008). Introduction to research methods. SAGE.

Heffron, R. J., & McCauley, D. (2014). Achieving sustainable supply chains through energy justice. Applied Energy, 123, 435-437. https://doi.org/10.1016/j.apenergy.2013.12.034

Heffron, R. J., McCauley, D., & Sovacool, B. K. (2015). Resolving society's energy trilemma through the Energy Justice Metric. Energy Policy, 87, 168-176. https://doi.org/10.1016/j.enpol.2015.08.033

Heffron, R. J., & McCauley, D. (2017). The concept of energy justice across the disciplines. Energy Policy, 105, 658-667. https://doi.org/10.1016/j.enpol.2017.03.018

Heffron, R. J., & McCauley, D. (2018). What is the 'Just Transition'? Geoforum, 88, 74-77. doi: 10.1016/j.geoforum.2017.11.016

Heffron, R. J. (2022). Applying energy justice into the energy transition. Renewable and Sustainable Energy Reviews, 156. https://doi.org/10.1016/j.rser.2021.111936

Hennink, M., & Kaiser, B. N. (2022). Sample sizes for saturation in qualitative research: A systematic review of empirical tests. *Social science & medicine*, *292*, 114523.

Hoffman, J., Davies, M., Bauwens, T., Späth, P., Hajer, M. A., Arifi, B., ... & Swilling, M. (2021). Working to align energy transitions and social equity: An integrative framework linking institutional work, imaginaries and energy justice. *Energy Research & Social Science*, *82*, 102317.

ILO. (2015). ILO Guidelines on just transition. Retrieved from https://www.ilo.org/publications/guidelines-just-transition-towards-environmentally-sustainable-economies

ILO. (2023). Green jobs, green economy. Retrieved from https://www.ilo.org/publications/green-jobs-green-economy-just-transition-and-related-concepts-review

Jenkins, K., McCauley, D., Heffron, R., Stephan, H., & Rehner, R. (2016). Energy justice: A conceptual review. Energy Research & Social Science, 11, 174-182. https://doi.org/10.1016/j.erss.2015.10.004

Jenkins, K., McCauley, D., & Forman, A. (2017). Energy justice: A policy approach. Energy Policy, 105, 631-634. https://doi.org/10.1016/j.enpol.2017.01.052

Jenkins, K. (2018). Setting energy justice apart from the crowd: Lessons from environmental and climate justice. Energy Research & Social Science, 39, 117-121. https://doi.org/10.1016/j.erss.2017.11.015

Leech, N. L., & Onwuegbuzie, A. J. (2007). An array of qualitative data analysis tools: A call for data analysis triangulation. School Psychology Quarterly, 22(4), 557-584. https://doi.org/10.1037/1045-3830.22.4.557

Leedy, P. D., & Ormrod, J. E. (2015). Practical research: Planning and design (11th ed.). Pearson.

Lieu, J., Sorman, A. H., Johnson, O. W., Virla, L. D., & Resurrección, B. P. (2020). Three sides to every story: Gender perspectives in energy transition pathways in Canada, Kenya, and Spain. Energy Research & Social Science, 68. https://doi.org/10.1016/j.erss.2020.101550

McCauley, D.A., Stephan, R.H., & Jenkins, K. (2013). Advancing Energy Justice. International Energy Law Review.

McCauley, D., & Heffron, R. (2018). Just transition: Integrating climate, energy, and environmental justice. Energy Policy, 119, 1-7. https://doi.org/10.1016/j.enpol.2018.04.014

Morse, J. M. (2015). Critical Analysis of Strategies for Determining Rigor in Qualitative Inquiry. Qualitative Health Research, 25(9), 1212-1222. https://doi.org/10.1177/1049732315588501

National Planning Commission. (2011). NDP 2030: Our future – make it work. Government of South Africa. Retrieved from https://www.gov.za/sites/default/files/gcis_document/201409/ndp-2030-our-future-make-it-workr.pdf

Ostry, J. J. A., Espinoza, R., & Papageorgiou, C. (2018). Economic Gains from Gender Inclusion: New Mechanisms, New Evidence. Retrieved from https://www.imf.org/economic-gains-from-gender-inclusion

Parikh, J. K. (1995). Gender issues in energy policy. Energy Policy, 23(9), 745-754.

PCC. (2022). South-Africas-Just-Energy-Transition-Investment-Plan-JET-IP-2023-2027. Retrieved from https://www.climatecommission.org.za/publications/sa-jet-ip

PPC. (2022). Framework-for-a-Just-Transition revised. Retrieved from https://www.climatecommission.org.za/publications/design-addition-and-amendment-to-just-transition-framework-with-dedication-to-pcc-secretary

PCC, (2023, July-November). Stakeholder Report: Energy Dialogue Series. https://pccommissionflo.imgix.net/uploads/images/Energy-Dialogue-Series-Report45.pdf

PCC, (2025, February), PCC Consultation on South Africa's 2035 NDC Targets: Local Government Session,

https://www.climatecommission.org.za/events/pcc-consultation-on-south-africas-2035-ndc-targets-local-government-session

Presidency, T. (2023). JET Implementation Plan 2023-2027. Retrieved from https://www.stateofthenation.gov.za/assets/downloads/JET%20Implementation%20Plan%202023-2027.pdf

Presidency, T. (2024). Climate Change Act. Retrieved from https://www.gov.za/sites/default/files/gcis_document/202407/50966climatechangeact222024.pdf

Pueyo, A. M. (2020). Gender and Energy: Opportunities for All. Retrieved from https://hdl.handle.net/20.500.12413/15115

Sachs, J. D., Lafortune, G., & Fuller, G. (2024). Sustainable Development Report 2024: The SDGs and the UN Summit of the Future. Paris: SDSN, Dublin: Dublin University Press. Retrieved from https://dashboards.sdgindex.org/downloads:contentReference[oaicite:0]{index=0}:contentReference[oaicite:1]{index=1}

Saldana, J. (2009). The Coding Manual for Qualitative Researchers.

Schlosberg, D., & Collins, L. B. (2014). From environmental to climate justice: climate change and the discourse of environmental justice. Wiley Interdisciplinary Reviews: Climate Change, 5(3), 359-374.

Sorman, A. H., García-Muros, X., Pizarro-Irizar, C., & Gonzalez-Eguino, M. (2020). Lost (and found) in Transition: Expert stakeholder insights on low-carbon energy transitions in Spain. Energy research & social science, 64, 101414.

Sovacool, B. K., Sidortsov, R. V., & Jones, B. R. (2014). Energy Security, Equality, and Justice. Routledge. ISBN: 9780415835345

Sovacool, B. K., & Dworkin, M. H. (2015). Global energy justice: Principles, problems, and practices. Cambridge University Press. ISBN: 9781107025540

Sovacool, B. K., Heffron, R. J., McCauley, D., & Goldthau, A. (2016). Energy decisions reframed as justice and ethical concerns. Nature Energy, 1(5). doi:10.1038/nenergy.2016.24

Sovacool, B. K., & Ryan, S. E. (2021). Energy Justice: Frameworks for Analysis and Design. Energy Research & Social Science, 71. https://doi.org/10.1016/j.erss.2020.101837

STATS SA. (2022). Labour Market Dynamics in South Africa 2022. Pretoria. Retrieved from https://www.statssa.gov.za/publications/Report-02-11-02/Report-02-11-022022.pdf

Staller, K. M. (2021). Big enough? Sampling in qualitative inquiry. *Qualitative Social Work*, *20*(4), 897-904.

Stalmeijer, R. E., Brown, M. E., & O'Brien, B. C. (2024). How to discuss transferability of qualitative research in health professions education. *The clinical teacher*, *21*(6), e13762.

Swilling, M., Musango, J., & Wakeford, J. (2015). Developmental States and Sustainability Transitions: Prospects of a Just Transition in South Africa.

Journal of Environmental Policy & Planning, 18(5), 650-672. https://doi:org/10.1080/1523908x.2015.1107716

Tracy, S. J. (2010). Qualitative quality: Eight “big-tent” criteria for excellent qualitative research. Qualitative Inquiry, 16(10), 837-851. https://doi.org/10.1177/1077800410383121

UNFCCC. (2015). Paris Agreement. Retrieved from https://unfccc.int/sites/default/files/english_paris_agreement.pdf

UNFCCC. (2022). Annual Report 2022. Retrieved from https://unfccc.int/annual-report-2022

Unicef. (2018). Gender glossary of terms and concepts. Retrieved from https://www.unicef.org/media/60806/file/Gender-glossary-of-terms-and-concepts-2018.pdf

Young, D. S., & Casey, E. A. (2019). An examination of the sufficiency of small qualitative samples. *Social Work Research*, *43*(1), 53-58.

WEC. (2020). World Energy Trilemma Index 2020. Retrieved from https://www.worldenergy.org/publications/entry/world-energy-trilemma-index-2020

APPENDIX A: PROFILE OF RESPONDENTS

Sector/Constituency	Position	Amount of people
National Government Gender/Energy/Climate Change	Senior Manager	2
Local Government	Senior Manager	1
Industry Association	Senior Manager	2
NGO Energy/Gender	Senior Manager	1
Women's organisation in energy	Senior Manager	1
Professional Women in Energy	Engineer/Technical	1
Women Entrepreneurs in Energy	Owners/Managers	1
Business owners in Clean Energy	Owners/Managers	1
Academia/Research Think Tank	Senior Manager	1
Civil Society	Senior Manager	1
Community level Gender NGO	Senior	1
TOTAL SAMPLE		11

APPENDIX B: RESEARCH OBJECTIVES

Research Objective	Research Question
1. Explore South Africa's transition to clean energy within the framework of a just transition	1.1. Describe your understanding of a just energy transition in South Africa? 1.2. Explain South Africa's current transition to clean energy? 1.3. Share your thoughts on the various professions that need to be involved to ensure a just energy transition?
2. Investigate the concept of gender inclusivity in South Africa's just transition to clean energy	2.1. What do you think is meant by gender inclusivity in South Africa's just energy transition? 2.2. What opportunities are there for greater participation of women in the just energy transition? 2.3. How do you see women being specifically impacted by a just energy transition?
3. Identify and examine the barriers to gender inclusivity in South Africa's clean energy transition	3.1. What do you believe are *societal* barriers to equal participation of women in a just energy transition? 3.2. What are *institutional* barriers to equal participation of women in the just energy transition? 3.3. What is necessary to remove barriers to women's participation in the just energy transition?

APPENDIX C: CONSISTENCY TABLE

Table 4. Consistency table: research questions, propositions, data collection and data analysis

	State Research Objective	Prop	State Proposition	Data collection detail	Data analysis method
1	Explore South Africa's transition to clean energy within the just energy framework	1	South Africa's clean energy transition is not fully aligned with the principles of a just transition.as it inadequately addresses the socioeconomic impacts on vulnerable communities	Literature review and interviews	Literature review
2.	Investigate the extent of gender inclusivity in South Africa's just transition to clean energy	1.1	Advancing gender inclusivity is essential to achieving South Africa's just transition to clean energy	Lit and Interview guide questions 1, 2, 3, 4, 5	Thematic analysis
3.	Identify and examine the barriers to gender inclusivity	1.2	Institutional, sociocultural and economic barriers significantly hinder the achievement of gender	Lit and Interview guide questions	Thematic analysis

	State Research Objective	Prop	State Proposition	Data collection detail	Data analysis method
	in South Africa's clean energy transition		inclusivity in South Africa's clean energy transition, limiting women's participation, leadership, and access to opportunities within the sector	3, 4, 5, 6, 7	

APPENDIX D: INTERVIEW SCHEDULE

Valerie Geen

Semi-Structured Interview Schedule

1. Describe your understanding of a just energy transition in a South Africa?
2. Explain South Africa's current transition to clean energy?
3. Share your thoughts on the various professions that need to be involved to ensure a just energy transition?
4. What do you think is meant by gender inclusivity in South Africa's just energy transition?
5. What opportunities are there for greater participation of women in the just energy transition?
6. How do you see women being specifically impacted by a just energy transition?
7. What do you believe are <u>societal</u> barriers to equal participation of women in a just energy transition?
8. What are *institutional* barriers to equal participation of women in the just energy transition?
9 What is necessary to remove barriers to women's participation in the just energy transition?

APPENDIX E: PARTICIPANT LETTER



UNIVERSITY OF THE
WITWATERSRAND,
JOHANNESBURG

Participant Information Sheet (PIS)

Wits Business School

Dear Sir / Madam

My name is Valerie Geen. I am a Masters student in The Management of Energy Leadership at the Wits Business School, Johannesburg. My supervisor is Dr Jenika Gobind. I am conducting a research study about Gender inclusivity in Just Energy Transition. The study title is: **Gender inclusivity towards a just energy transition in South Africa**

I am inviting you to take part in an interview. If you decide to take part, your participation in this research study will last about one hour and will be virtual – on Teams. The interview will take place on Teams on ----- at [this time].

With your permission, I would like to audio record the interview. This data will be stored in a secure encrypted file for five years and deleted after five years. Only the researcher will have access to the data.

During the research activity, I will need to ask for some personal information about you, including professional title and relation or experience in the subject matter/topic

The interview will be confidential and anonymous. When I share the results of the research study, I will not include your name or anything else that could identify you. With your permission, other researchers may use the data collected from this research study, but your name and any personal information will not be used or passed on.

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

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

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

If you have any questions during or afterwards about this research study, feel free to contact me or my supervisor on the details listed below. If you have any concerns or complaints about the ethical procedures of this research study, you are welcome to contact the University Human Research Ethics Committee, telephone +27(0) 11 717 1408, email
hrecnon-medical@wits.ac.za.

Yours sincerely,
Valerie Geen

Researcher:
Valerie Geen: 9105965Y@students.wits.ac.za, 0832879163

Supervisor:
Dr Jenika Gobind, Jenika.gobind@wits.ac.za, 0117173761

APPENDIX F: CONSENT FORM



UNIVERSITY OF THE
WITWATERSRAND,
JOHANNESBURG

Consent Form

Wits Business School

Master's in management of Energy Leadership (MMEL):

Gender inclusivity towards a just energy transition in South Africa

Valerie Geen

I, ……..,…. agree to participate in this research project.

I agree to the following:

(Please circle the relevant options below)

The research study was explained to me. I understand what this study is about.	YES	NO
I understand that I can volunteer to take part in the study	YES	NO
I agree that the interview may be audio recorded	YES	NO
I agree that direct quotations from my interview may be used by the researcher in their research report	YES	NO
I agree that my participation will remain anonymous (my name or other identifying data will not be used by the researcher in their research report/manuscript/book chapter)	YES	NO
I agree that other researchers may use the information I provide in my **interview**/focus group/other activity (depending on their own ethics clearance being obtained) but my name and any personal information will not be used or passed on	YES	NO

…… (signature)

…… (name of participant)

…… (date)

…… (signature)

…… (name of researcher/person seeking consent)

…… (date)