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2026-09-21

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https://hdl.handle.net/10539/50092

Mhlana S., Phalatse S., Taylor J., Ledger T. and Cassim A., 2026. “Assessing Gender in the South African Just Energy Transition.” SCIS Working Paper. No. 79. Johannesburg: Southern Centre for Inequality Studies, University of the Witwatersrand.

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SCIS Working Paper: 79

Assessing Gender in the South African Just Energy Transition

Authors: Siviwe Mhlana, Sonia Phalatse, Julia Taylor, Tracey Ledger and Alia Cassim | 2026

Acknowledgements

This report is the product of a collaboration between the Southern Centre for Inequality Studies (SCIS) at the University of the Witwatersrand and The World Bank Group.

The authors would like to express their sincere gratitude to the participants, whose experiences and expertise greatly informed the findings and recommendations presented in this report. We would also like to thank Samaneh Hemat and Bandita Sijapati at the World Bank, as well as Imraan Valodia at SCIS, for their guidance and support throughout the project.

Finally, thank you also to Avela Njwambe and Melody Madubeko for their research assistance, to Pauline Dhlamini and Khanimamba Masuluke for their project support, and to Alexis Grewan for copyediting.

The findings, interpretations and conclusions expressed in this report are those of the authors and do not necessarily reflect the views of The World Bank or the Southern Centre for Inequality Studies.

Recommended citation:

Mhlana S., Phalatse S., Taylor J., Ledger T. and Cassim A., 2026. "*Assessing Gender in the South African Just Energy Transition*." SCIS Working Paper. No. 79. Johannesburg: Southern Centre for Inequality Studies, University of the Witwatersrand.

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Introduction

Over the last decade, there has been increased pressure for governments to strengthen their international response to climate change. Central to recommendations in the international policy domain is the transition to a low-carbon economy and the potential opportunities this presents for maintaining global temperatures at sustainable levels while recognising the imperatives of decent work, gender equality and the eradication of poverty and inequality globally. In line with this, there has been a new wave of interest in the concept of a *just transition* from South African policymakers, trade unions and researchers. The concept, which first emerged out of the trade union movement in the United States in the 1970s, has received wide recognition in development policy for its usefulness for centring workers and society in policies aimed at mitigating the impacts of climate change globally. In South Africa, this has resulted in various reports on just transition pathways, including the establishment of the Just Energy Transition Partnership in 2021, and the Just Transition Framework published by the Presidential Climate Commission in 2022. Yet, despite the general recognition of the need for *justice* in the transition to a low-carbon and climate-resilient economy at the discursive level, the wide adoption of *justice* in the climate policy landscape has been slow to implement. Proponents of the just transition argue that as the concept has increasingly become mainstreamed, there have been significant divergences in how it is understood and applied in local and international development policy plans.

According to the Congress of South African Trade Unions (2022), at its core, the just transition is a radical concept aimed at ensuring fairness, justice and the inclusion of the most vulnerable members of our society. Despite this, gender remains a significant gap in current conceptualisations of a just transition. In addition, little research has explored how different experiences of the just transition are shaped by the dynamics of power and where and how people and communities are located in multiple structures of society. Thus, in order to address this gap, this report adopts an intersectional gendered framework to:

- assess the status of gender inequality in the South African energy sector;
- examine how pre-existing structural inequalities, social norms and gender dynamics determine women's participation in the South African energy sector; and

- identify barriers and potential pathways for the inclusion of women and marginalised communities in policies for a just energy transition.

The report is divided into seven sections and is structured as follows. Following this introduction, the first section provides a brief overview of existing policies for a just energy transition. The section considers how existing policy plans have engaged with the issue of gender in the energy transition and the limitations for achieving *justice* through current conceptualisation of the approach. The second section provides a brief overview of the conceptual approach used to achieve the abovementioned aims. This is followed by a discussion of the data and methodological approaches used in the third section, before providing a detailed quantitative analysis on the characteristics, profile and gendered labour market trends of the South African coal mining and electricity industries in the fourth section. The fifth section then evaluates the social norms and gender dynamics determining women's participation in the just transition based on the experiences of current workers in the energy sector. This is then complemented by a case study of the broader impacts of the transition on women and households in the coal mining village of Komati, Mpumalanga, in section six. Finally, the report concludes with key recommendations to policymakers for achieving gender equality and advancing women's participation in the South African energy transition.

Existing Policies for a Just Energy Transition

The concept of a *just transition* is not new to South Africa's development landscape. The transition has been a part of South Africa's policy plans since the 2012 National Development Plan. The Just Transition Framework (June 2022) was developed through research and consultation across South Africa. The framework highlights gender inequality and the disproportionate impact of climate change on women, children, youth, poor and marginalised communities. The solutions discussed mention women empowerment and even the provision of childcare to support women's ability to participate in policy processes. These options may support greater involvement from women in policymaking and even in businesses (PCC 2022). However, the framework does not cover an analysis of broader issues of gender inequality in South Africa, and whether these could be addressed through policies for a just transition. A question that remains, which is not addressed in the framework, is whether or not

and how gender inequality in the energy sector and beyond can be positively influenced through new policies that will be developed in support of a just transition.

The framework was followed by a Just Energy Transition Investment Plan published in November 2022 that was intended to be linked to the Just Transition Framework. However, it was developed by a different grouping within the Presidency, the Presidential Climate Finance Task Team. The Just Transition Framework provides an overarching guide for the economy-wide transition whereas the Just Energy Transition Investment Plan focuses on energy. The Investment Plan was criticised for deviating significantly from the framework in that it did not focus on the three pillars of justice—distributive, procedural and restorative justice.

In terms of addressing gender inequality, the Plan acknowledges gender inequality and even the gendered impacts of access to electricity. Gender inequality is a focus area within the skills section of the plan, which states:

> Addressing gender, inequality, and social exclusion: This is required in both the provision of education and training opportunities as well as access to employment. Particular attention will be given to transitioning women, youth, and other vulnerable groups from education and training into decent work, including equal access to promotions to management and leadership roles. (RSA 2022, 99).

The Plan acknowledges the importance of gender and other forms of social exclusion for achieving the just energy transition. While committing to equal access is useful, understanding the structural issues that cause inequality is critical. Key issues to be considered for a gender just transition include women's labour participation in the energy sector, conditions of work in the energy sector for both women and men, access to resources, distribution of care work, energy poverty, sexism and racism in the workplace, and representation in decision-making, to name a few. Hence, this paper applies an intersectional gender approach to bring new insights that could inform policymaking and implementation of a gender just transition.

Conceptual Approach

This study applies an intersectional gender framework to assess the potential impacts of policies for a just energy transition on the South African economy and society. Intersectionality emphasises a multifaceted approach for investigating how power relations in society converge to shape experiences within the economic system (Ogando et al. 2023). This suggests an additional dimension to understanding global inequality and the ability of individuals and communities to overcome complex economic and social problems. According to Collins and Bilge (2020), there are four distinctive and interconnected domains of power. The *structural* domain of power refers to the power contained in social structures such as government, households and the labour market. The *cultural* domain of power refers to the norms, values and expectations within a given society. The *interpersonal* domain of power refers to how individuals' experiences with multiple systems of power influence and shape their position within the social, economic and political context and inform differentiated vulnerabilities within the social system. Finally, the *disciplinary* domain of power refers to how varying degrees of power and vulnerability are further entrenched by the rules and regulations that govern society and people's inclusion or marginalisation within this domain.

According to Kaijser and Kronsell (2014), the responsibility, vulnerability and decision-making power of individuals and groups in relation to climate change are associated with social categories such as gender, socio-economic status, ethnicity, nationality, health, sexual orientation, age and geographic location. Therefore, since proposals for a just energy transition suggest implementation through various social, cultural and economic processes, the need for intersectional analyses is pertinent. Further, intersectionality could generate new knowledge to facilitate the equitable inclusion of groups that are marginalised in existing policies for a just energy transition. Drawing on Collins and Bilge (2020), Misra et al (2020) propose five methodological tenets for doing intersectional research. These tenets resonate with various feminist and gender theories which argue that dismantling gender as a structural principle for the organisation of society is foundational to the equitable distribution of people's labour, power and well-being in the global economic system. Moreover, transforming the structures that have allowed inequalities to persist is fundamental to any real change that can be achieved in the global economic system (Lahiri-Dutt, 2023).

Table 1 outlines how the framework will be applied based on the key principles of intersectional research (Collins and Bilge, 2020; Misra et al., 2020). These principles allow us to answer the key aims of the report and make recommendations for policies for the inclusion of women, workers and households in policies for a just energy transition.

Table 1: Intersectional Gender Approach

Principle	**General application in research**	**Application of gender in JET (just energy transition) project**
Oppression	Develops questions that uncover the reality of how oppression/vulnerability manifests and is experienced across multiple domains of power in a society.	Oppression/vulnerability is observed through four interrelated domains of gendered power relations: 1) distribution of labour and economic roles, 2) access to assets and resources, 3) norms and values, 4) institutions, rules and decision-making (Lahiri-Dutt et al., 2022). The study considers questions on the gendered dynamics and lived experiences in energy transitions, social and cultural norms, bureaucratic processes, access to assets, services and institutions.
Complexity	Considers the nuances and flexibility of socially constructed differences.	Sectoral approach. Analysis of multiple forms of marginalisation and vulnerability to policies for a JET.
Context	Analyses how inequality emerges and is expressed based on the particular social, legal, political and economic context.	Contextual analysis of existing and historic structural conditions.

		Contextual analysis of the barriers and opportunities for a gender-inclusive JET in South Africa.
Comparison	Assesses the variations of multiple categories and points of inquiry.	Sectoral analysis of differences relating to distribution of jobs, earnings and decision-making in the energy sector. Differences according to race, gender and geographic location.
Relationality	Evaluates the links between oppression/vulnerability and privilege/advantage.	Analysis of the relationship between vulnerability and opportunity in the energy sector. Identification of common demands and opportunities for achieving an inclusive JET in South Africa.

Source: Own table adapted from Ogando et al. 2023

Data and Methods

This study combines an analysis of existing survey-based quantitative data with a qualitative methodology based on a case study of the South African energy sector and the area of Komati Village, Mpumalanga, where a coal power station was recently decommissioned. The study makes use of data from the Quarterly Labour Force Survey (QLFS) (StatsSA 2024) to determine the gendered trends in the South African energy sector. The QLFSs, which were officially introduced in 2008, provide detailed information on the demographic characteristics and labour market participation of approximately 30,000 households across the country. Since such nationally representative data are collected annually, it was useful for determining how work in the energy sector has changed since the period prior to the Covid-19 pandemic and since various policies for a just energy transition have been adopted by the national government. Further, the data from the QLFS provides necessary information

regarding formal and informal employment, occupational status, highest level of education, and information related to access to legal and social protections, such as union membership, contributions to pension, unemployment insurance, medical aid benefits, paid sick leave and parental leave benefits.

In addition to the QLFS, a small-scale household survey was conducted with 43 households in Komati Village, Mpumalanga province. The household survey explored the lived reality of the energy transition in a coal mining community in South Africa, particularly the implications of the decommissioning of coal-generated electricity plants on the lives and livelihoods of workers and households in the affected area. Komati is one of the central areas where the energy transition has already begun to take place, making it an appropriate case study for assessing the implications of the energy transition in South Africa.

The quantitative aspect was complemented by a qualitative approach to explore the granularity of social norms and gender dynamics that determine women's participation in the energy sector. The qualitative aspect involved two focus group discussions with community members in Komati as well as in-depth qualitative interviews with women entrepreneurs, workers and experts in the energy sector. Participants for the qualitative interviews were identified based on a purposive sampling approach using desktop research and door-to-door interviews as part of the household survey. The qualitative aspect uncovered the lived reality of the energy transition as experienced by households and experts in a developing country context. In addition, researchers at the Public Affairs Research Institute (PARI) with whom we collaborated for the study had been working in the area for six months prior to the study and had existing working relationships in the area. The focus groups each consisted of a total of five participants, one representing all female participants and another with both male and female members of the coal mining community. A total of 12 in-depth interviews were conducted with women entrepreneurs, workers and experts in the coal and renewable energy sector. The interview participants had all been working in the sector for over 10 years and were equipped to share their perspectives on the experiences of women in the South African energy sector. The qualitative interviews were crucial for illuminating the barriers and potential pathways for the inclusion of women in the South African energy transition.

Limitations

To assess the gendered implications of the energy transition in South Africa, this report has employed a mixed-method approach, combining survey-based quantitative data with a qualitative approach. The quantitative aspect relied on data from quarterly labour force surveys. While the data from the QLFS is intended to be representative at national and provincial levels, there were several limitations that were encountered when using quantitative data to assess the implications of economic policies on the lives and livelihoods of workers and communities in each context. First, the data from the QLFS is designed to be representative at the 3-digit industry level, but it does not provide disaggregated data at the subsector and provincial levels. Second, while the QLFS provides occupation-level data at the industry level, information on the type of job that workers are employed in is not provided. Further, the short reference period of the QLFS may not capture activities of informal workers, including temporary, casual and seasonal work, in the labour market.

Despite these limitations, it is possible to provide an analysis of the gendered implications of the energy transition at the sectoral level using a variety of approaches. This report uses QLFS data for the first quarters of 2019 and 2024 to determine the gendered labour market trends in employment, level of education, occupation, work status, and formal versus informal employment. Considering the impacts of Covid-19 on global labour markets, the report analyses the periods before and after the pandemic to examine the gendered trends of South Africa's just energy transition. The industry is defined according to the standard industrial classification, i.e. coal mining (SIC210) and electricity (SIC411). By defining the industries according to this classification, we were able to assess the impact of the energy transition in the South African labour market by demographics and geographic location. Further, we adopted the International Labour Organizatin (ILO) and Statistics South Africa employment-based definition of informality to evaluate the degree of precariousness of energy jobs in the labour market. Therefore, informality is defined according to the conditions of employment/work status and by workers' access/lack of access to legal and social protections on the job.

The aggregated data at the provincial level was complemented by a household survey of the coal mining town of Komati, Mpumalanga and qualitative interviews with women workers and experts in the South African energy sector. Obtaining access to workers was particularly challenging for the

research. As such, we recognise that the interviews included in this report (women professionals and experts in the energy sector) may not be reflective of the diversity of experiences of the entire energy workforce. However, with the focus on gender and barriers to women's leadership and participation in the just transition, we believe that the participant interviews provided relevant and sufficient insights on the topic. Further, while the small sample size of 12 qualitative interviews restricted our ability to make inferences regarding differentiated impacts at the sectoral level, the qualitative approaches used provide a nuanced account of experiences at the individual, household and community levels.

Therefore, by using a mixed-method approach, the study could combat each of the limitations outlined in this section and expand the literature on energy transitions by providing an empirical examination of how the energy transition has been experienced in the South African context.

Gendered Labour Market Trends in the South African Energy Sector

The following section provides quantitative estimates of the gendered labour market characteristics of the South African coal mining (SIC210) and electricity industries (SIC411). We examine the percentages of employees working in the energy sector, based on the characteristics typically associated with formal stable jobs, to determine the various categories of worker most likely to be impacted by the transition to a low-carbon economy. These categories include women, non-standard and informal workers.

Table 2 illustrates the distribution of employment in the energy sector[1] by province in the first quarters of 2019 and 2024. In 2019, the coal mining and the electricity industries made up 0.46 per cent and 0.60 per cent of national employment respectively, compared to 0.49% and 0.41% in 2024. Data also shows that the coal mines in Mpumalanga account for about 80% of coal mine workers in South Africa. The electricity sector is largely made up of the state-owned entity Eskom and other municipal agencies. Looking at Mpumalanga, while employment in the electricity industry decreased by 29.74% between 2019 and 2024, employment in coal mining increased over the same period.

[1] We use the term 'energy sector' to refer to the coal mining industry (SIC 210) and the collection, production and distribution of electricity industry (SIC 411). This includes the renewable energy industry.

Table 2: Employment Distribution by Industry and Province

No. of employees	Coal mining				Electricity			
	2019	**2024**	**Absolute change**	**% change**	**2019**	**2024**	**Absolute change**	**% change**
Western Cape	0	0	0	0	7409	3946	3463	-46.74
Eastern Cape	0	0	0	0	2995	1736	1259	-42.04
Northern Cape	0	0	0	0	1334	995	339	-25.41
Free State	361	1018	657	181.99	2590	2742	152	5.90
KwaZulu-Natal	5888	2442	3446	-58.53	3204	6242	3038	94.82
North West	2015	0	2015	-100.00	6036	1733	4303	-71.30
Gauteng	3873	5798	1925	49.70	30488	12680	17808	-58.41
Mpumalanga	61957	65819	3862	6.23	34856	27840	7016	-20.13
Limpopo	1232	7429	6197	503.00	8161	10290	2129	26.08
Total	**75326**	**82507**	**7181**	**9.53**	**97073**	**68203**	**28870**	**-29.74**

Source: Own calculations from 2019 and 2024 (first quarter) QLFS (StatsSA 2024)

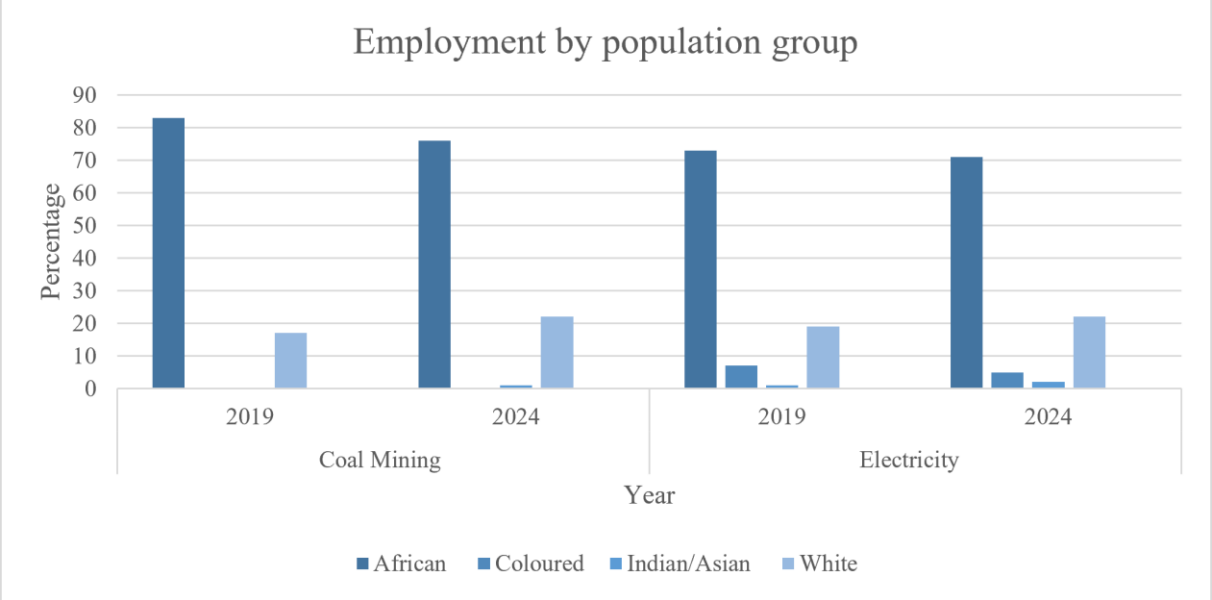
Note: The data are weighted.

The following diagrams illustrate the demographic distribution of employment in the South African energy sector by gender and race. Figure 2 indicates that employment in the South African energy sector is disproportionately male. However, the gap between male and female workers in the coal mining sector has narrowed from 2019 to 2024. In 2024, male workers comprised 68% of coal mining jobs compared to 82% in 2019. In contrast, there have been no significant changes in the gender composition of the electricity sector in the same period. In 2019, males made up 74% of jobs compared to 26% of female workers. Similarly, female workers only comprised 27% of the electricity sector in 2024. As the electricity industry is where we would expect renewable energy to be counted,

this indicates that the expansion in renewable energy has not significantly affected the participation of women in the energy sector labour force.

Figure 1 shows that the average worker in the coal mining industry is (black) African. African workers represented 76% of all workers in the industry in 2024 compared to 1% Indian/Asian workers and 22% White workers. Likewise, Africans represent the majority of workers in the production, collection and distribution of electricity. In 2024, African workers comprised 71% of workers in the electricity industry compared to 5% coloured workers, 2% Indian/Asian workers and 22% white workers. This is unsurprising given the history of labour in the South African mining industry and the racial inequalities that have persisted throughout the post-apartheid period (Mhlana 2023). However, there has been a notable decrease in the number of African workers employed compared to white workers whose representation in the sector has increased in both the coal mining and electricity industry in the period 2019 to 2024. Possible causes are explored in the subsequent sections.

Figure 1: Percentage of Employees in the Energy Sector by Population Group

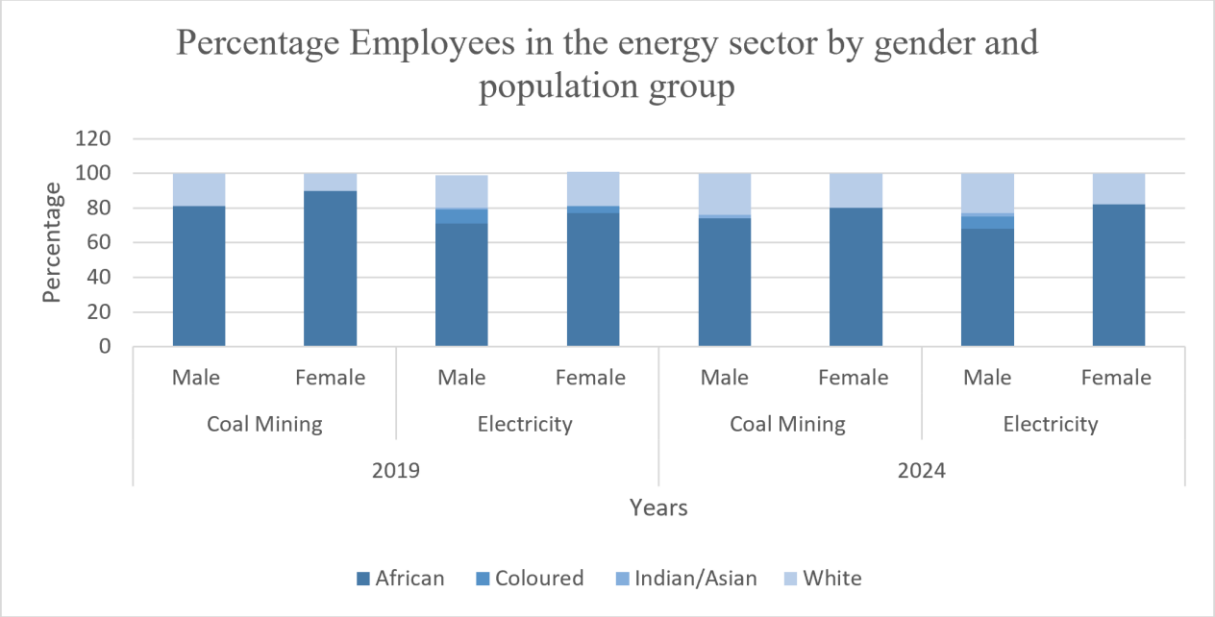


Source: Own calculations from 2019 and 2024 (first quarter) QLFS (StatsSA 2024)

Note: The data are weighted.

Figure 2 illustrates the percentage of employees in the energy sector by gender and population group. For the period 2019 to 2024, the electricity industry workforce had slightly more racial diversity than coal mining. However, in line with the data on gender composition, racial diversity in the sector has been largely dominated by male workers. This trend appears to be continuing with a decrease in coloured female workers employed in the energy sector from 4% to 0% in the period 2019 to 2024. There was a slight increase in the share of Indian workers in the coal mining and electricity industry in 2024.

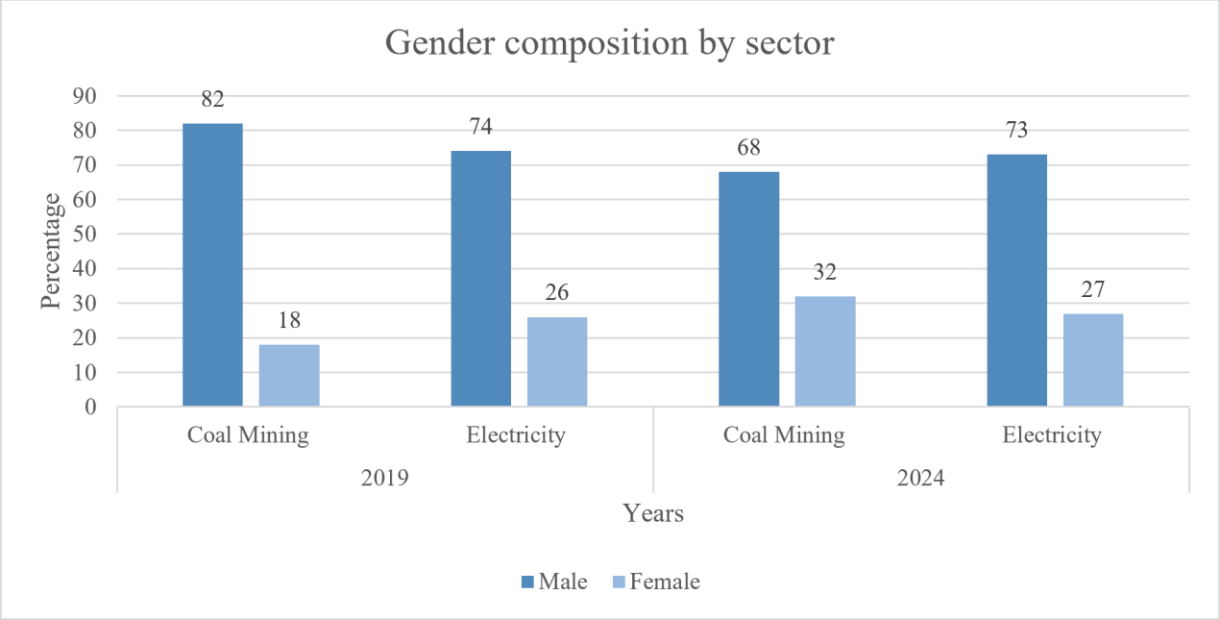
Figure 2: Employment by Gender and Population Group



Source: Own calculations from 2019 and 2024 (first quarter) QLFS (StatsSA 2024)

Note: The data are weighted.

Figure 3: Gender Composition of the Labour Force in Coal Mining and Electricity



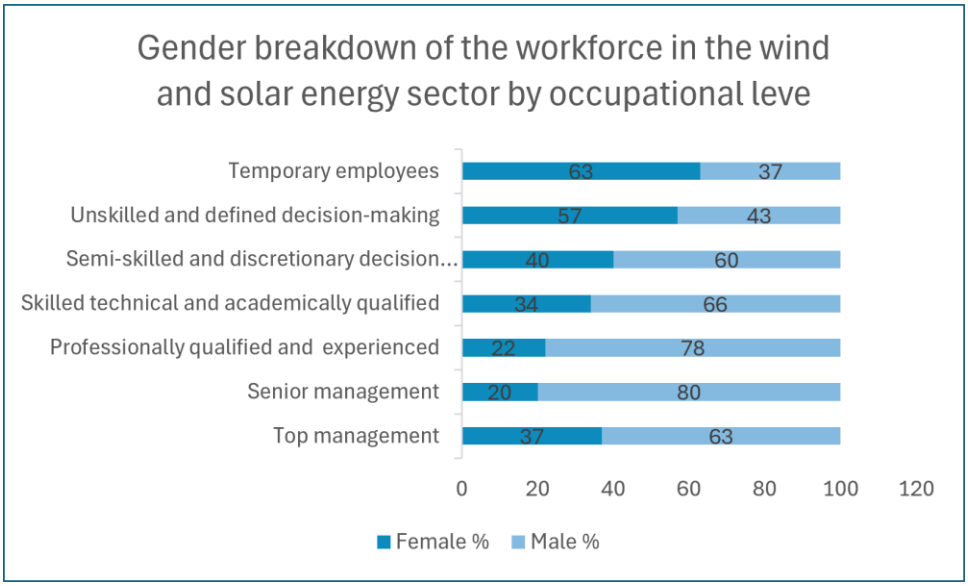
Source: Own calculations from 2019 and 2024 (first quarter) QLFS (StatsSA 2024)

Note: The data are weighted.

Disaggregated data on the renewable energy industry are not available in the QLFS. In order to fill the gap in the analysis of the renewable energy industry specifically, we reviewed other existing literature.

While there is not a lot of data available on the number of women working in renewable energy, there are a few reports which indicate that the portion of women workers in renewable energy is also low. A survey by GIZ on the wind and solar energy sectors in South Africa found that women made up 33% of employees (GIZ 2022). A further analysis also found that women were overrepresented in the lower skilled categories of worker, as shown in Figure 4.

Figure 4: Percentage of Employees by Gender and Occupational Level of Surveyed Companies



Source: GIZ 2022

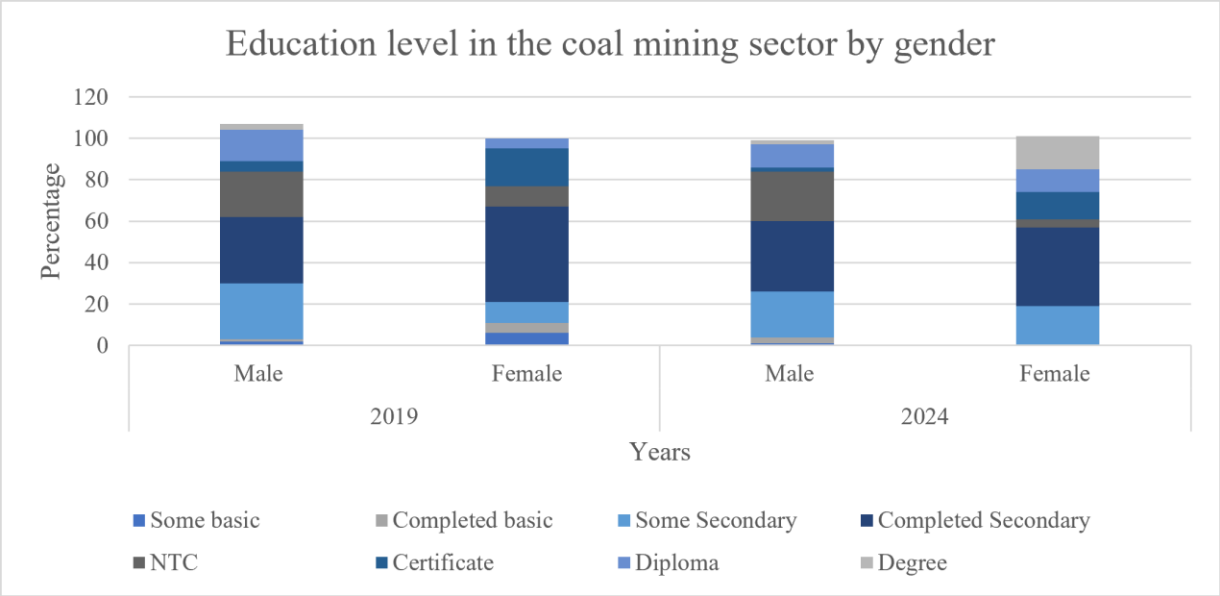
A report by the International Finance Corporation (IFC) similarly found that women's representation in renewable energy in sub-Saharan Africa was lower than expected, with women holding 27% of board membership positions, 30% of CEO roles, 16% of Vice-President/Directors and 26% of middle and lower management roles (IFC 2022). An interesting finding from the IFC report was that women were more likely to be employed in a small-scale decentralised renewable energy systems, as opposed to large-scale grid-connected systems, in sub-Saharan Africa. Women represented 37% of the workforce in small-scale utilities relative to 22% in large-scale utilities (IFC 2022, viii). The reasons given to explain this include issues with travelling to the site for the large-scale plants which may be in outlying areas, challenging physical conditions and the need for technical training.

Highest Level of Education

Figure 5 illustrates the education level in the coal mining industry by gender. Consistent with previous studies, the data shows that, on average, female workers tend to have higher qualifications than male workers in the coal mining industry. In 2024, 38% of female workers in the industry had completed secondary education compared to 34% of male workers. Female workers were also more likely to hold

a degree qualification in the industry compared to their male counterparts who were more likely to have a national training certificate or other post-school training. It is worth noting, however, that there has been a significant decline in the share of female workers with completed secondary education in the industry from 2019 to 2024. During this period, the percentage of female workers with completed secondary education decreased from 46% in 2019 to 38% in 2024. The percentage of female workers with a national training certificate also fell by over half during this period from 10% in 2019 to 4% in 2024. A likely cause was the Covid-19 pandemic, with young women and girls reported to have been disproportionately impacted by school closures and increased care responsibilities during this period (Casale and Shepherd 2020).

Figure 5: Education Level in the Coal Mining Industry by Gender

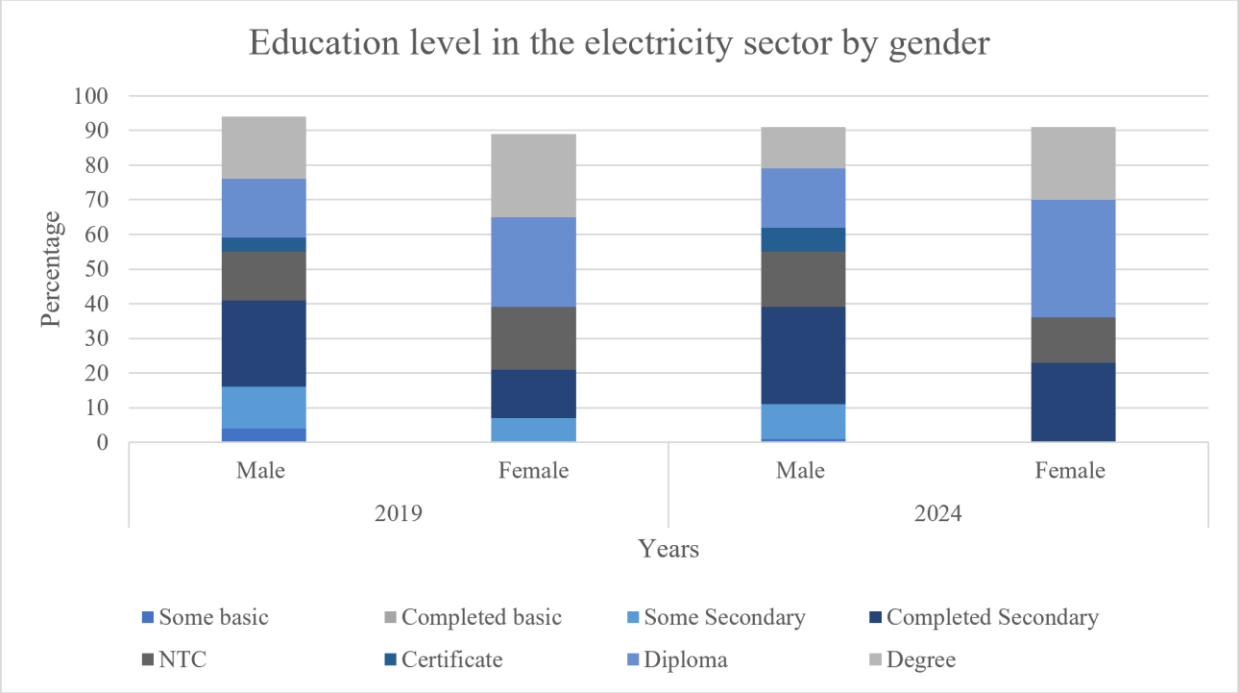


Source: Own calculations from 2019 and 2024 (first quarter) QLFS (StatsSA 2024)
Note: The data are weighted.

In contrast, Figure 6 indicates that, on average, male workers in the electricity industry were more likely to have completed secondary education than female workers. However, female workers were more likely to have a diploma and degree level qualification in the industry than male workers who were more likely to have a national training certificate or other post-school education in the sector. In 2024, 34% of female workers in the electricity industry had a diploma compared to 17% of male

workers. In addition, 21% of female workers in the electricity industry had a degree level qualification compared to 12% of male workers. This suggests that female workers in the electricity sector have higher levels of qualification than their male counterparts.

Figure 6: Education Level in the Electricity Sector by Gender



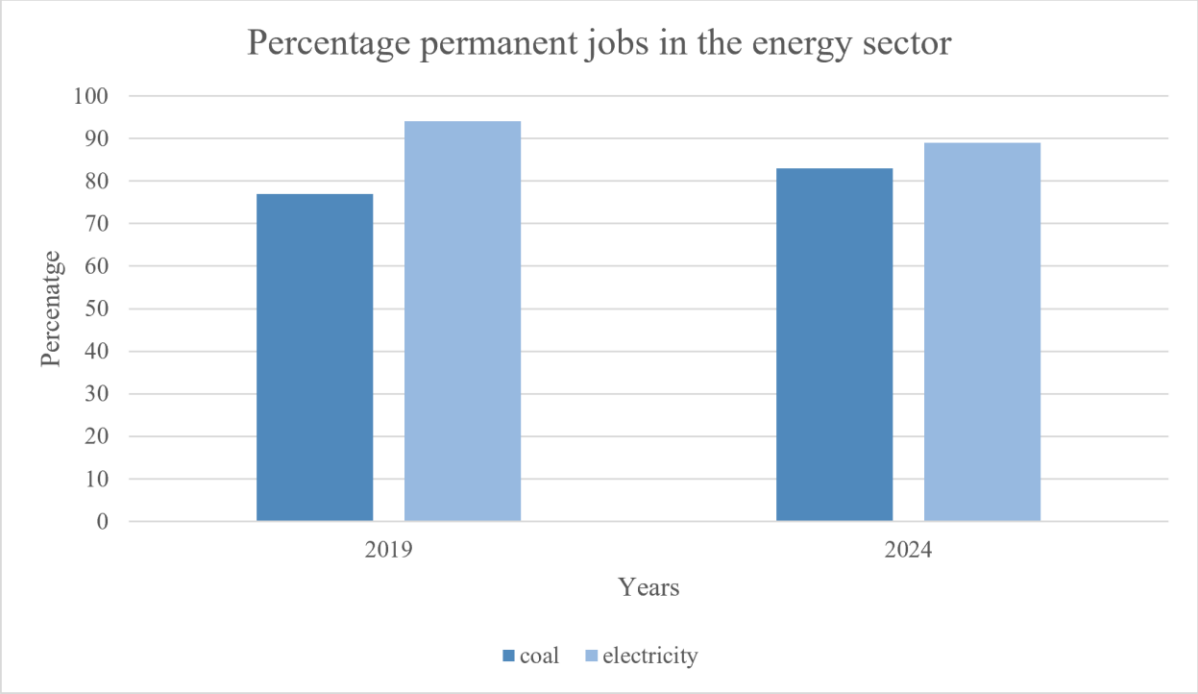
Source: Own calculations from 2019 and 2024 (first quarter) QLFS (StatsSA 2024)

Note: The data are weighted

Work Status

The diagrams that follow illustrate the nature of employment in the energy sector by contract duration. Figure 7 indicates that workers in the electricity industry are more likely to be on permanent contracts than workers in the coal mining industry. There has been a history of casualisation of mine workers through labour brokers or sub-contracting labour, which has left workers particularly vulnerable (Kenny and Bezuidenhout 1999). While Figure 8 indicates that female workers are more likely to be permanent than male workers in the South African energy sector, the proportion of women on permanent contracts has lessened between 2019 and 2024.

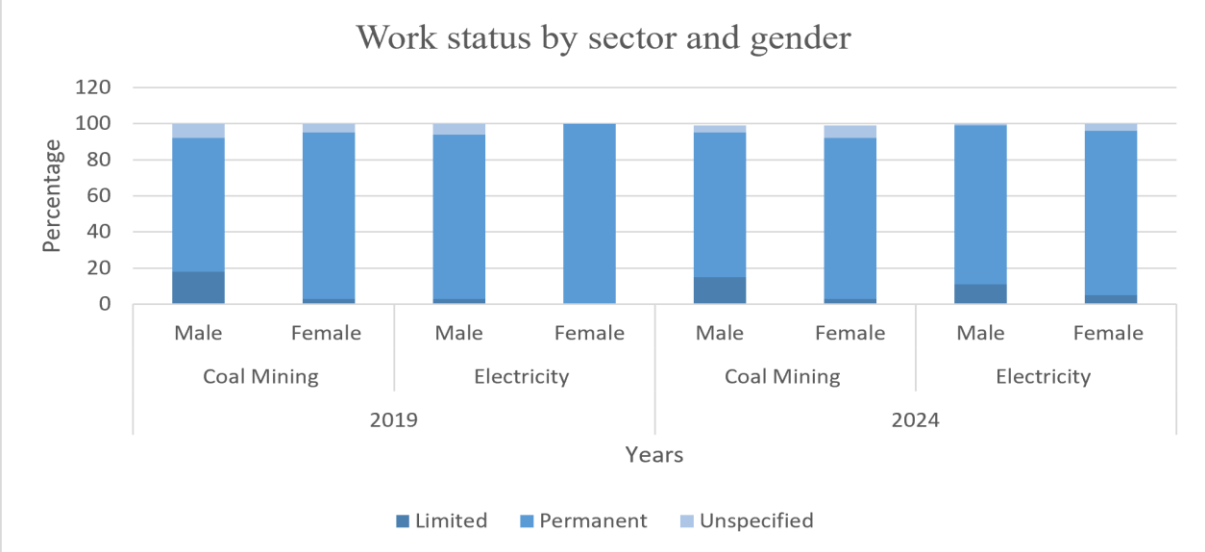
Figure 7: Permanent Jobs by Sector



Source: Own calculations from 2019 and 2024 (first quarter) QLFS (StatsSA 2024)

Note: The data are weighted.

Figure 8: Work Status by Sector and Gender

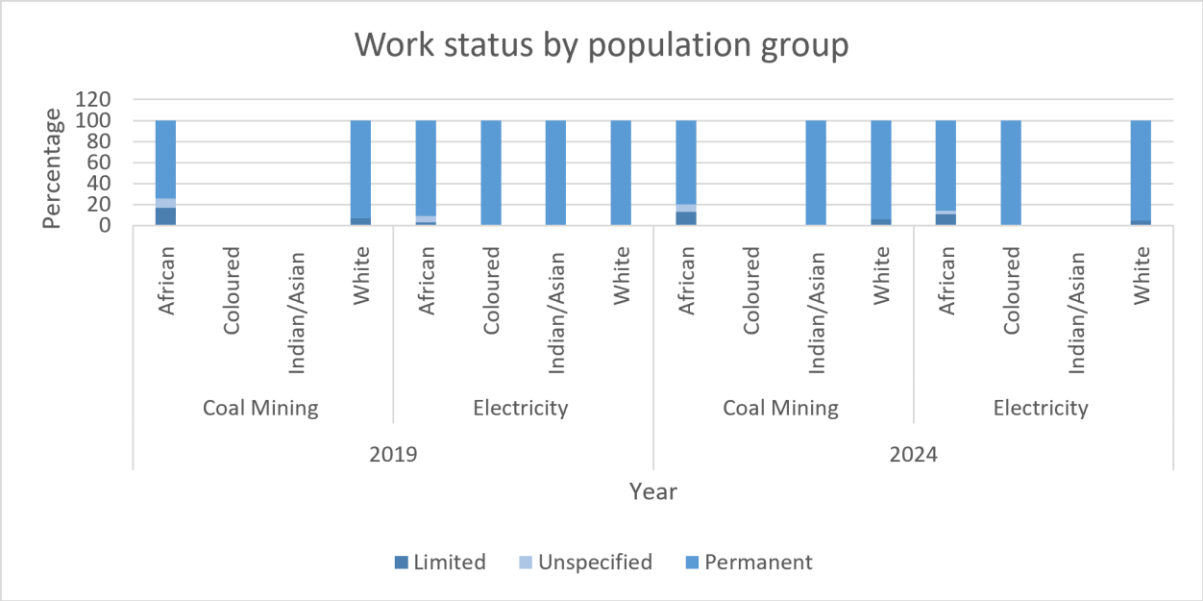


Source: Own calculations from 2019 and 2024 (first quarter) QLFS (StatsSA 2024)

Note: The data are weighted.

Further, Figure 9 indicates that African workers are less likely to be employed on permanent contracts than other racial groups in the South African energy sector. This suggests that precarity in the sector is racialised with African workers more likely to be employed on limited duration contracts or with unspecified working arrangements than other racial groups in the sector. Further, for the period 2019 to 2024, Africans were more likely to have secure stable jobs in the electricity industry than in the coal mining industry.

Figure 9: Work Status by Population Group



Source: Own calculations from 2019 and 2024 (first quarter) QLFS (StatsSA 2024)

Note: The data are weighted.

Occupation by Gender

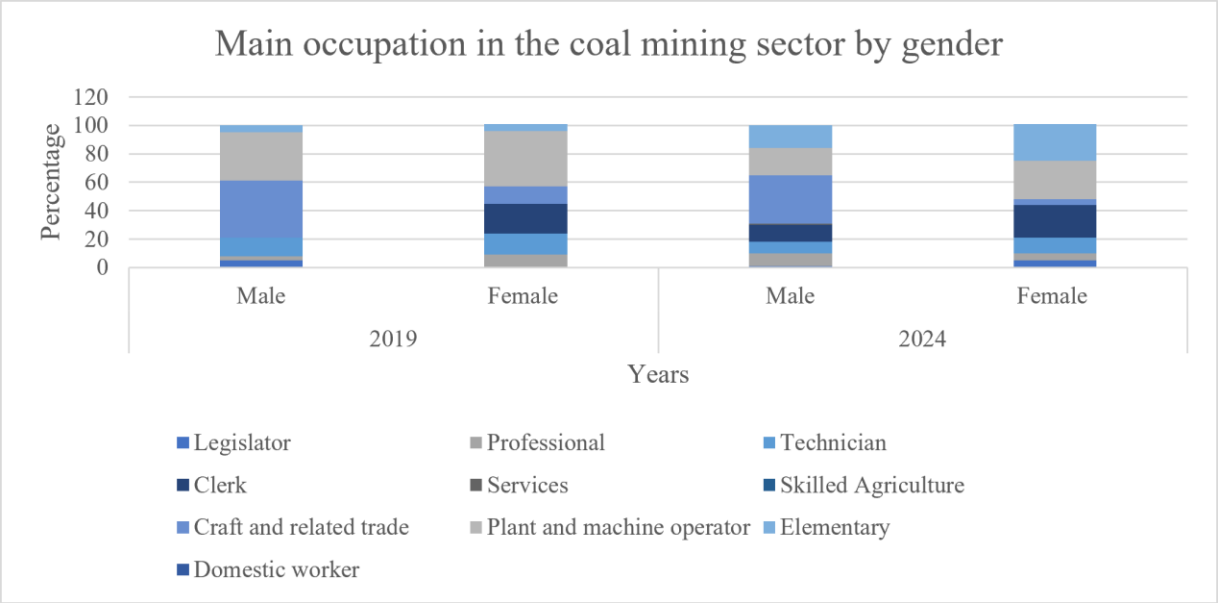
The following two graphs illustrate the main occupations in the energy sector by gender. While most workers in coal mining are male, Figure 10 indicates that the majority of jobs held by male workers in the industry are semi-skilled jobs, such as craft and related trades.[2] In 2024, 34% of male workers in

[2] According to the International Standard for the Classification of Occupations (2008), craft and related trades refer to semi-skilled occupations that apply specific skills and technical knowledge to produce, maintain, or construct various objects, structures, or tools in different sectors, including construction, textiles, machinery, and food production.

the coal mining industry were employed in craft and related trades compared to 4% of female workers. In contrast, female workers were more likely to be employed as plant and machine operators, in elementary positions, or as clerks in the industry. In 2024, 26% of female workers were employed in elementary positions compared to 16% of male workers. Female workers were also less likely to be employed in professional roles in the industry than male workers.

In contrast, female workers appear to have greater opportunities in the electricity industry than in the coal mining industry. While female electricity workers are still disproportionately represented in administrative related roles such as clerks, Figure 11 shows that they are also more likely to be in professional roles than male workers. In 2024, 14% of female workers in the electricity industry were employed in professional roles compared to 12% of male workers in the industry. In addition, 20% of female workers in the industry were employed as legislators compared to 17% of male workers.

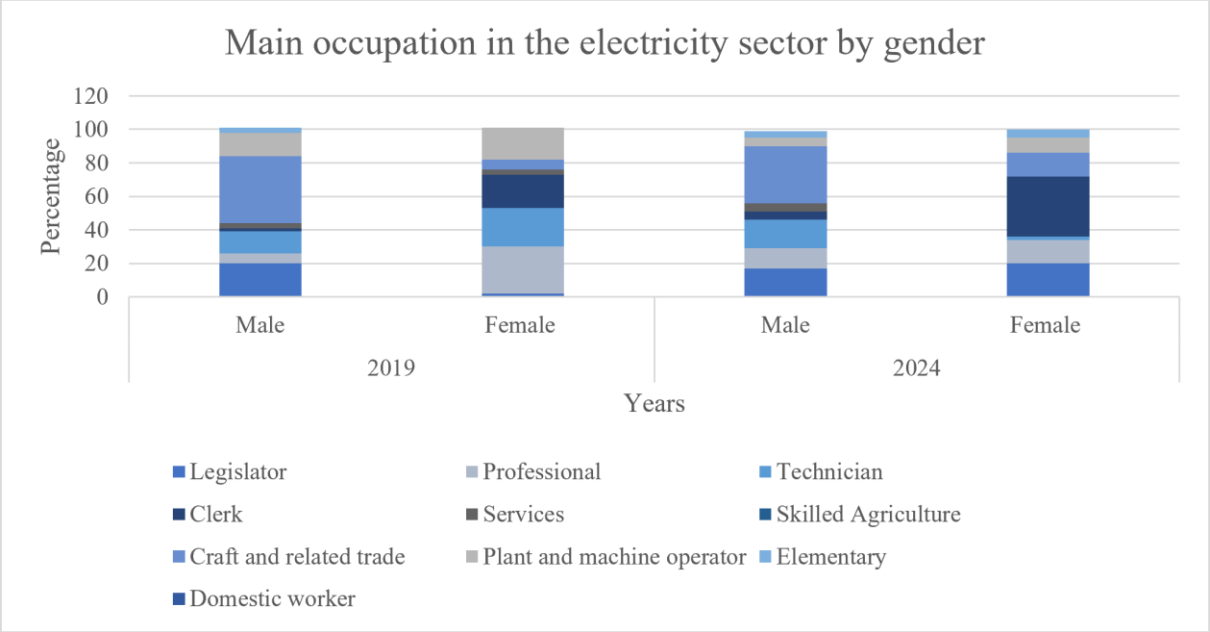
Figure 10: Main Occupation in the Coal Mining Sector by Gender



Source: Own calculations from 2019 and 2024 (first quarter) QLFS (StatsSA 2024)

Note: The data are weighted.

Figure 11: Main Occupation in the Electricity Sector by Gender



Source: Own calculations from 2019 and 2024 (first quarter) QLFS (StatsSA 2024)

Note: The data are weighted.

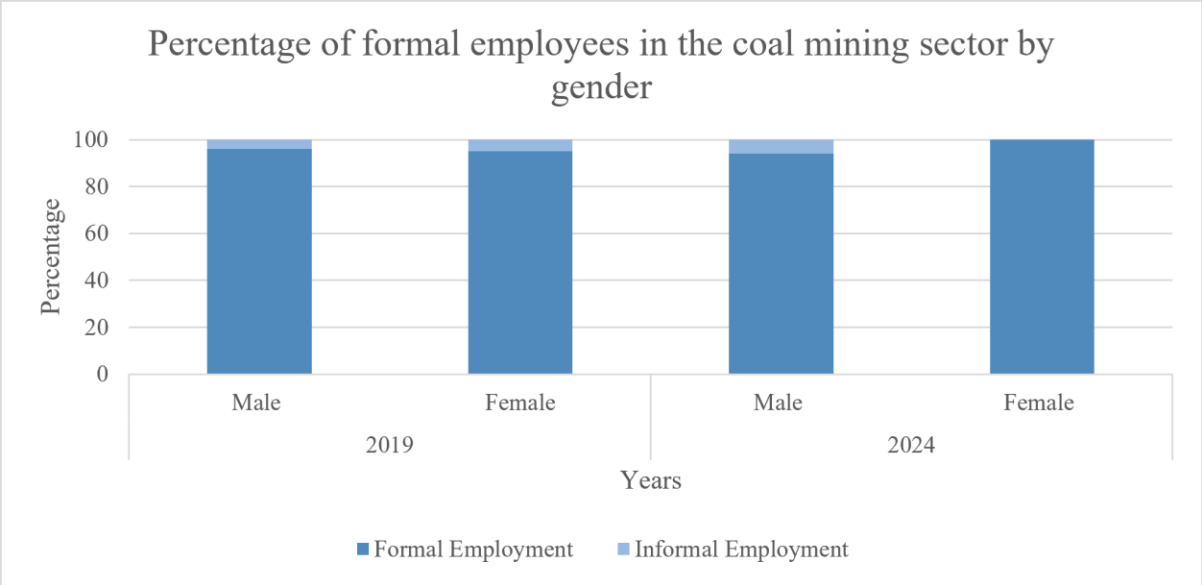
Formal vs Informal Work

This section evaluates the incidence of and gendered trends of informality in the South African energy sector. The study uses the ILO and Statistics South Africa definitions of informal and precarious employment, that is, employment lacking the regulatory requirements that characterise formal or stable jobs, such as the right to unionisation, contributions to pension/retirement fund benefits, medical aid benefits, UIF, paid sick leave and maternity/paternity leave benefits. The hypothesis is that workers who lack legal and social protections are more vulnerable to energy transition if existing challenges, such as persistent gender and racial inequalities in the labour market, are not acknowledged and addressed.

Figures 12 and 13 illustrate the percentages of employees in the South African energy sector who are employed in formal jobs by gender. Figure 12 shows that in 2024, all female workers and nearly all male workers in the coal mining industry were formal, despite a slight increase in informality for males. Similarly, Figure 13 indicates that only a small percentage of male and female workers in the electricity

industry were employed in the informal sector. However, studies suggest that informality in the South African labour market is generally underestimated in the data (Rogan and Skinner 2018). Further, informal work is often characterised by non-standard and temporary work arrangements, often through informal labour brokers in the economy (Mhlana 2023). Thus, using the expanded employment-based definition of informality, the subsequent sections examine the percentages of workers in the South African energy sector who lack legal and social protections to determine the real levels of informality and/or precariousness in the sector.

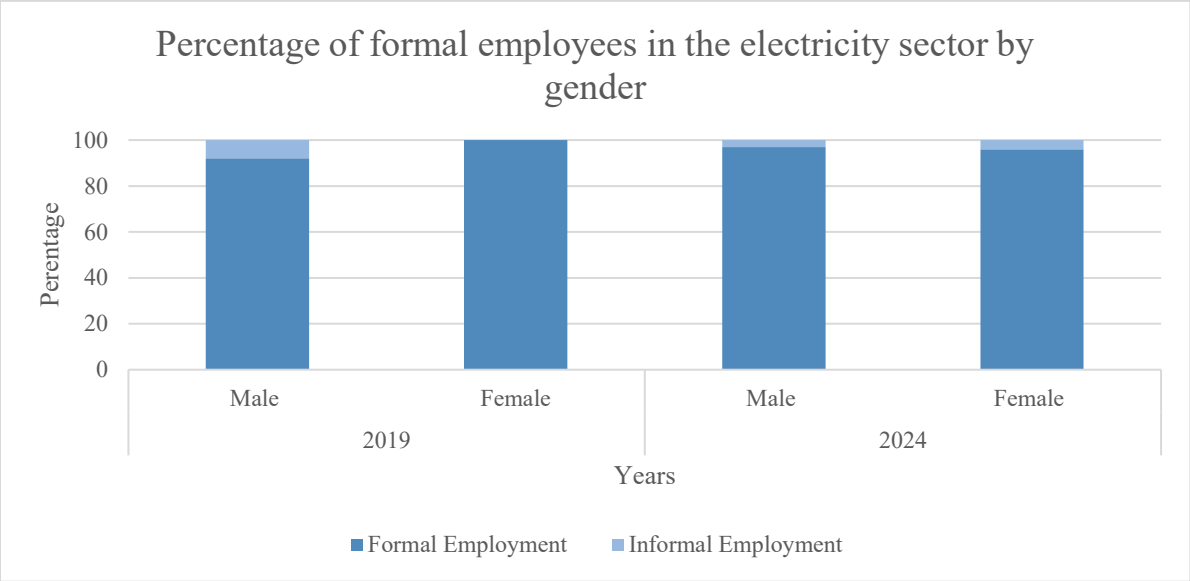
Figure 12: Percentage of Formal Employees in the Coal Mining Sector by Gender



Source: Own calculations from 2019 and 2024 (first quarter) QLFS (StatsSA 2024)

Note: The data are weighted.

Figure 13: Percentage of Formal Employees in the Electricity Sector by Gender



Source: Own calculations from 2019 and 2024 (first quarter) QLFS (StatsSA 2024)

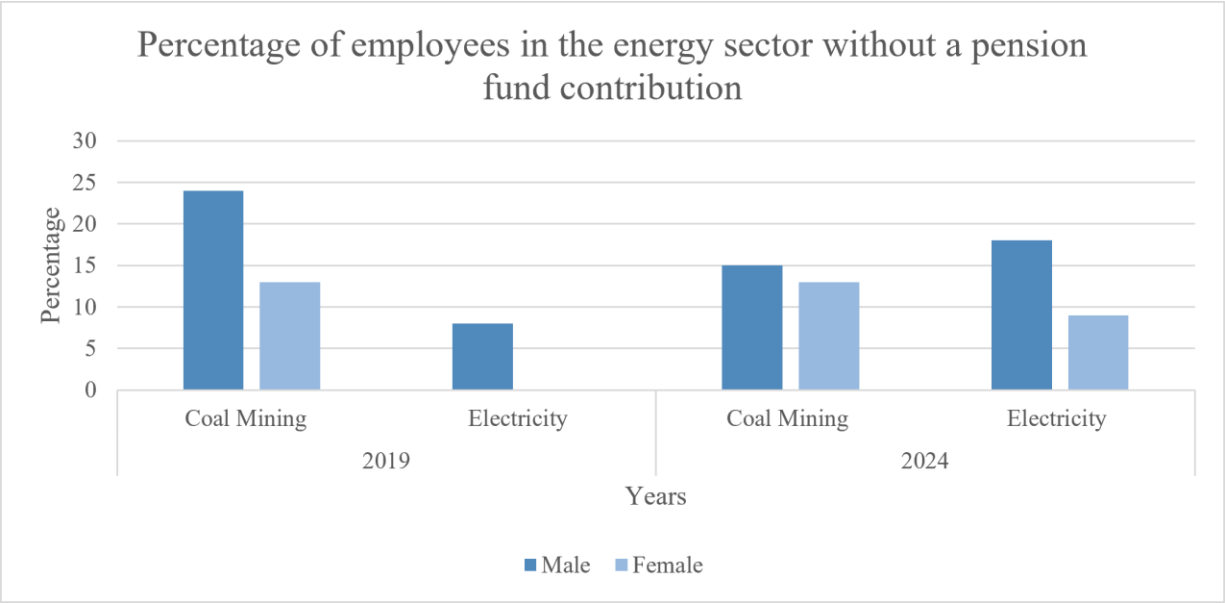
Note: The data are weighted.

Access to Social Protections

This section examines the percentage of employees without employment-based social protections. Estimates in this section are based on the Statistics South Africa operationalisation of the ILO definitions of informality outlined in the previous section. Based on this approach, the diagrams that follow indicate that in the South African energy sector male workers are less likely to have employment-based social protections (such as medical aid, paid sick leave, unemployment insurance and pension fund benefits) than female workers. Further, for the period 2019 to 2024, the number of employees in the electricity industry without employment-based social protections has been rising. The data shows that the percentage of employees in the electricity industry who did not receive a pension/retirement fund contribution from their employer increased from 8% of male workers and 0% of female workers in 2019 to 18% of male workers and 9% of female workers in 2024. In line with this, there has been a 10% increase in the number of electricity workers without paid maternity/paternity leave benefits in the sector. In addition, the percentage of employees in the electricity industry without UIF benefits has also increased, suggesting a possible increase in temporary workers. In 2019, only 3% of male workers and 0% of female workers did not have Unemployment

Insurance fund (UIF) deductions compared to 20% of male workers and 17% of female workers in 2024. While the QLFS does not provide sufficient information on the relationship between main occupation and job security, earlier sections show that in the energy sector, male workers are more likely to be employed in craft and related trades, suggesting that there may be a relationship between precariousness and the type of jobs that individuals are employed in.

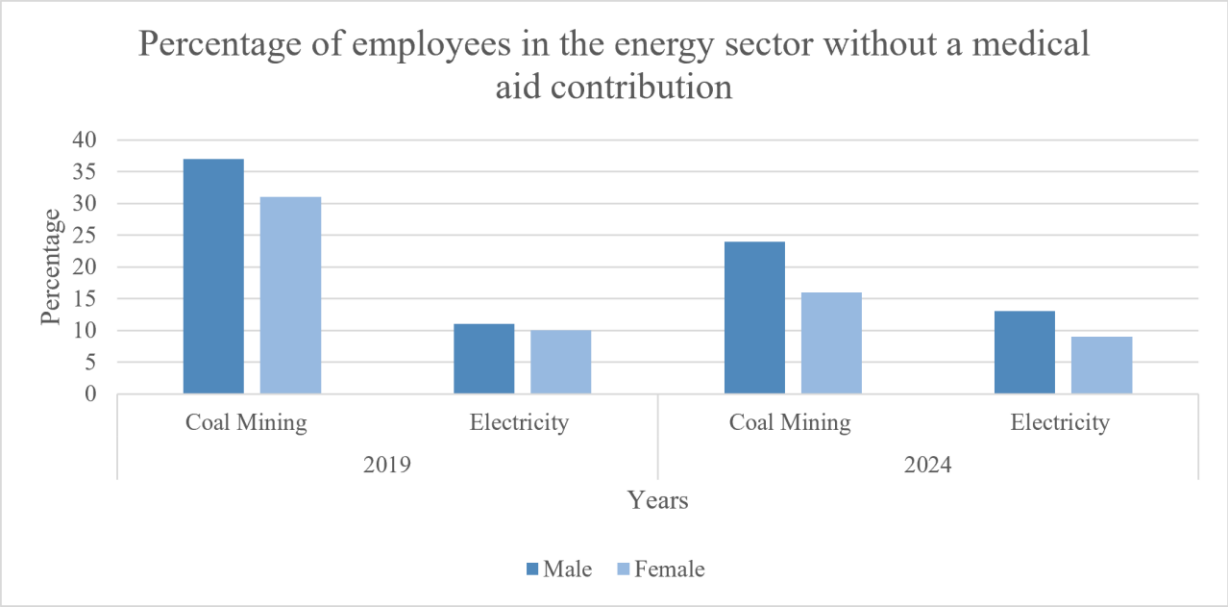
Figure 14: Percentage of Employees in the Energy Sector Without a Pension Fund Contribution by Gender



Source: Own calculations from 2019 and 2024 (first quarter) QLFS (StatsSA 2024)

Note: The data are weighted.

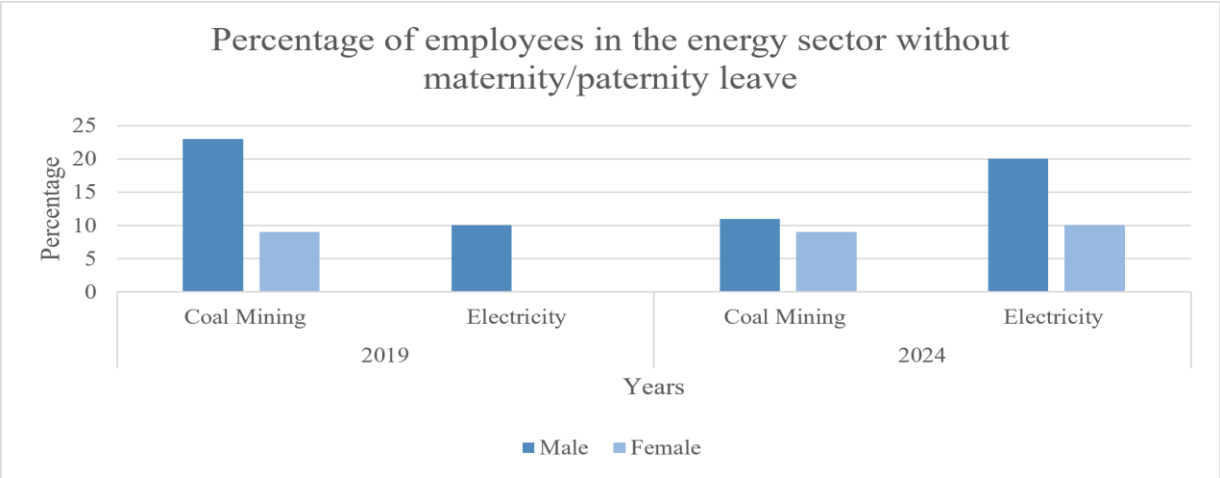
Figure 15: Percentage of Employees in the Energy Sector Without a Medical Aid Contribution by Gender



Source: Own calculations from 2019 and 2024 (first quarter) QLFS (StatsSA 2024)

Note: The data are weighted.

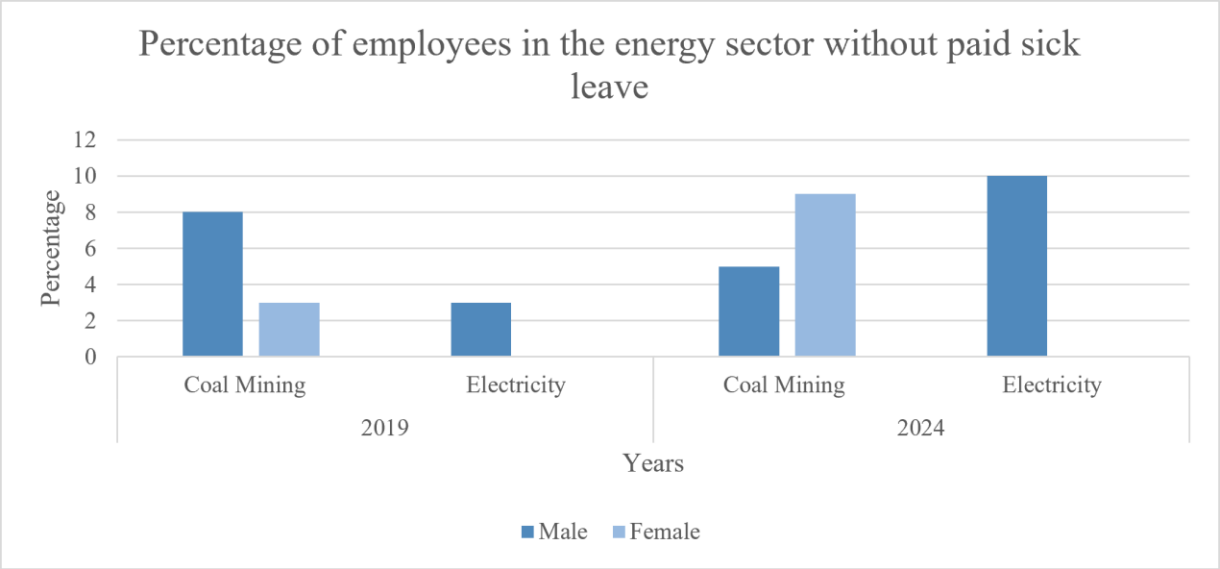
Figure 16: Percentage of Employees in the Energy Sector Without Maternity/Paternity Leave by Gender



Source: Own calculations from 2019 and 2024 (first quarter) QLFS (StatsSA 2024)

Note: The data are weighted.

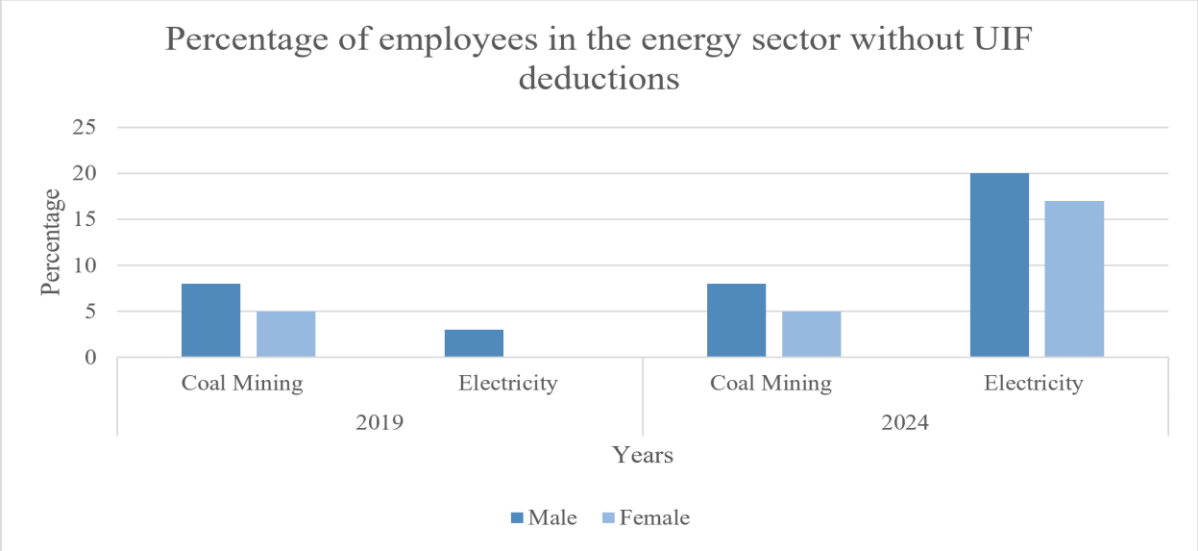
Figure 17: Percentage of Employees in the Energy Sector Without Paid Sick Leave by Gender



Source: Own calculations from 2019 and 2024 (first quarter) QLFS (StatsSA 2024)

Note: The data is weighted.

Figure 18: Percentage of Employees in the Energy Sector Without Unemployment Insurance Fund Benefits



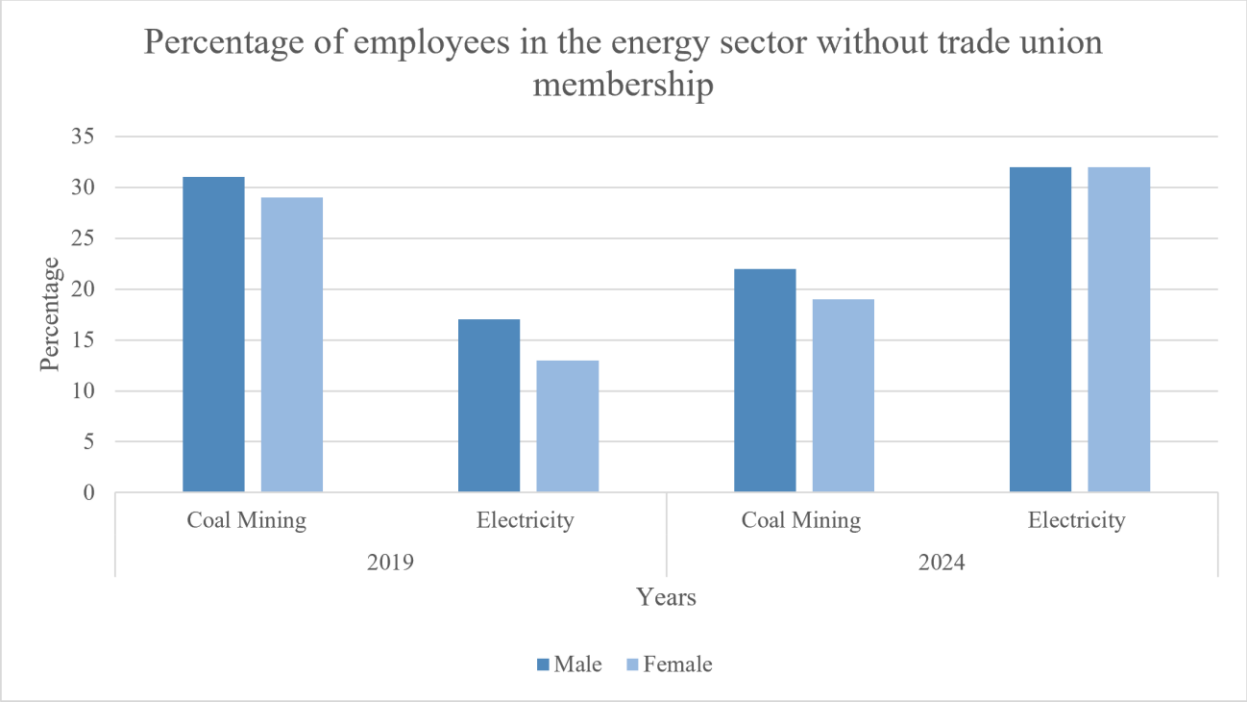
Source: Own calculations from 2019 and 2024 (first quarter) QLFS (StatsSA 2024)

Note: The data is weighted.

Union Density

Finally, Figure 19 illustrates the percentage of employees in the energy sector without a trade union membership by gender. Historically, trade unions have played an active role in the South African mining sector. The data shows that in the period 2019 to 2024, union density in the electricity industry decreased while workers in the coal mining industry were increasingly becoming unionised. In the period 2019 to 2024, the percentage of male and female workers in the coal mining industry without a trade union membership decreased from 31% of male workers and 29% of female workers in 2019 to 22% of male workers and 19% of female workers in 2024. In contrast, the percentage of employees in the electricity industry without a trade union membership increased from 17% of male workers and 13% of female workers in 2019 to 32% of both male and female workers in 2024.

Figure 19: Percentage of Employees in the Energy Sector Without Trade Union Membership



Source: Own calculations from 2019 and 2024 (first quarter) QLFS (StatsSA 2024)

Note: The data are weighted.

Key Takeaways

This section assessed the gendered labour market trends in the South African energy sector. The authors note the challenge of capturing intersecting gendered vulnerabilities in the sector using quantitative data alone. For this reason, the data provided in this section are intended to serve as a snapshot of the pre-existing historic, structural and gendered inequalities before delving deeper into the kinds of marginalisation/vulnerability that exist within the South African energy sector and the possibilities and challenges for achieving a gender just energy transition based on the experiences of workers and households in the South Africa economy. It is clear from our analysis that despite the focus on gender equality in existing plans, addressing the historic racialised and gendered legacy of inequality in the sector remains a key issue for achieving a just transition.

The data in this section show that while the gap between male and female labour force participation appears to be narrowing, the sector remains disproportionately male, with women more likely to be employed in elementary positions despite higher levels of qualifications than their male counterparts. Our findings illustrate that women's participation in the electricity industry is higher than that in the coal industry. This is promising for the objective of addressing gender inequality as the energy mix shifts away from coal. However, since the QLFS does not provide information on the type of job related to skill level, further research is required to determine the kinds of opportunities available for promoting gender equality in the sector.

Finally, while the data for the period suggests low levels of informality for both male and female workers in the sector, it is important to note that this is likely an underestimation as the QLFS does not provide detailed information on workers employed through temporary employment services or the controversial category of "independent contractors" not entitled to job-based legal and social protections in the sector. Moreover, the growing trend in the number of workers without legal and social protections is concerning as previous studies have shown a relationship between gender and vulnerability to informal and precarious work (Mhlana 2023). Thus, guaranteeing decent stable jobs – with their associated legal and social benefits – will be critical to achieving a gender just energy transition in the South African context.

To complement the broad statistical picture illustrated in this section, the following section presents a qualitative case study on the social norms and gender dynamics that have informed the trends in the South African energy sector. In addition, the section explores the potential opportunities and challenges for the equitable inclusion of women as both participants and leaders of the energy transition, drawing on the experiences of current experts and professionals in the sector.

Social Norms and Gender Dynamics: Workers Experiences in the Energy Sector

So far, the policy discourse on the just energy transition has focused on green jobs, the transferability of skills and the potential for job creation. While this narrative has been crucial for advancing efforts towards sustainable development, little has been said about decent jobs and the experiences, concerns and perceptions of workers already employed in the energy sector. In particular, this concerns the gendered implications of the energy transition within and outside of the workplace, the ways that the transition is already being experienced, and the complexities and challenges in a context of consistently high levels of unemployment, low female labour force participation, casualisation and declining job security. This section is concerned with the experiences and perceptions of workers currently in the energy sectors. It employs a qualitative approach to explore the grounded realities of energy transitions in the South African energy sector.

A descriptive qualitative approach is used to explore the trends in energy transitions from the perspectives of workers presently experiencing the transition. Through an interpretation of the findings, the section illustrates the implications of the energy transition on workers' lives within and outside of the workplace. In particular, the section examines the implications that the energy transition has had on the roles and responsibilities in the workplace, job security, occupational health and safety, opportunities for future work, advancements in gender equality, family, and work–life balance.

The qualitative aspect of this research involved 12 semi-structured interviews with women professionals in the energy sector. Each of the respondents had been working in the South African energy sector for over 10 years and had experience working in the coal mining and/or the renewable energy sector. In addition, having held different positions in the energy sector throughout their careers,

respondents were well equipped to discuss the impact of the energy transition on workers' lives and livelihoods at various points of the transition. Six of the respondents were working at Eskom and were involved in the decommissioning of the Komati power plant and the other six were entrepreneurs in the renewable energy sector. The perspectives of women in the energy sector were useful in uncovering the barriers and potential pathways for advancing gender equality and promoting the role of women, not only as workers, but also as leaders within the just energy transition in South Africa.

Workplace Transitions and the Changing Nature of Work

Based on the experiences of workers at the Komati power plant, this section begins by examining the ways in which work in the energy sector has changed in terms of working arrangements, roles and responsibilities in the workplace. The section then turns to workers' general perceptions of the transition in relation to their experiences of work. The section sets the context for the subsequent analysis of institutionalised gender discrimination in the workplace. Findings from the qualitative interviews suggest that there are many factors that influence women's decisions about their work, including disproportionate care responsibilities in the household. As one respondent explained in relation to a decision about whether to leave Komati after the coal power plant was decommissioned:

> You start questioning whether you're making the right decision by staying. You wonder if your loyalty will pay off or not. I think, for me, my decision to stay was mostly about my family. My kids were in high school, and I didn't want to uproot them and upset the whole family. But there were moments when I wondered if I was making the right choice. Would I be left behind with no options if everyone else left?

In addition to workplace restructuring, the lack of communication about the closure of Komati and the energy transition heightened concerns about the future of employment in the sector. According to respondents, the closure of the coal mining plant in Komati was undertaken without clear communication and consultation with the workers. The information provided to workers also varied based on work status. For example, contractors were not privy to the changes related to the transition and relied on the incomplete information of community leaders or the generosity of certain levels of

management. This resulted in a rapid spread of misinformation, sparking fear and frustration among members of the work force. One manager reflected on the "chaotic" period:

> It was a bit chaotic … because I was speaking to the guys on the shop floor … Most of them were contractors as well, so they had no information. I had a little bit, because of the management meetings I'd attend, so I had an idea of where we were going … They were relying on community leaders to give them feedback, but I made sure that whenever I had information I would share it with my team to say: 'Ok guys, for the next three months you are safe,' just to keep them up to date, or I'd say: 'Look, we're not shutting down; we're not coming back'.

While some respondents looked forward to the opportunity to gain new skills in their job, a general concern among workers was the reduced opportunities in renewables compared to coal mining. Indeed, the promise in economic policies has been the transferability of skills from coal-dependent jobs to renewable energy. However, interviews suggest that labour has carried the greatest burden of the transition, both in the loss of jobs and in their adaptability to new working conditions and the attainment of new skills in the sector. As one worker explained, families have not been spared from the impacts of the transition, and in some ways, workers have had to restructure their own family and household lives alongside restructuring in the workplace.

> I had just had a baby when we applied for this, for this opportunity, and now I was only one qualifying. My manager had to say 'Thandeka [pseudonym] please we cannot drop the ball. We cannot send people that are not from Komati.' At the time, I took six months maternity leave. I had to cut my maternity leave to five months because anyway the sixth month it's more like your own choice it's not paid. I asked my manager if I could bring the baby, and they agreed. I have another two girls that had to be left behind with my husband. And you know, as a woman and when you just had a baby, you want to focus more on the baby. So, the fact that they were allowing me to go with the baby made me happy. I took my sister with me to help, and Eskom provided a two-bedroom accommodation, and my sister was staying behind with the baby. It was tough managing a newborn and going through training, then I was breastfeeding, and I had to pump sometimes during the workshop but then you need to tell your coach that you are coming because you are busy pumping and at night a baby's still a baby and I have to take care

> of him and sleep with him in the night. In the morning, I go back; sometimes I didn't have enough sleep, and I still need to go and listen and learn something new. My job was more HR and so it was challenging having to switch to the more technical things. My mind had to go back to engineering, plus the baby, and now it's a new environment, Cape Town, dozens of kilometres away from my husband that I've stayed with for more than 10 years, seeing him every day. Now I cannot see him every day.

Respondents suggest that many of the negative impacts of the transition could have been avoided if the sector had taken a proactive rather than a reactive approach to the transition.

> If we had started having these conversations earlier, we could have led the transition, not done it under pressure. We should have looked at Komati and said, 'This plant has 15 years left in its lifespan; where is the world going in 15 years?' […] We didn't have that conversation 10 or 15 years ago, so now we're scrambling to deal with it. A lot of the discussions we're having now are happening under pressure, which is why there are conflicts and protests. It feels like something is being imposed on people … The idea with a transition is that you minimise the gap. A year after the shutdown, we should have been producing energy.

Workplace Vulnerability and the Gendered Division Of Work

While there is growing acceptance of women in the energy sector, the energy sector remains disproportionately male, irrespective of the technologies used (coal mining or renewable energy). Despite there being few differences in the duties performed by men and women in the sector, women experienced varying degrees of gender discrimination in the workplace. In the coal mining industry, perceptions of women's vulnerability presented in the day-to-day activities and interactions with male coworkers on the shopfloor. In particular, findings based on qualitative interviews revealed a general perception from male workers that the energy sector is not suitable for women. There are many factors influencing perceptions about women in the energy sector but in coal mining, most can be linked to the physical nature of the job. For example, in many industries, men and women are responsible for moving around heavy equipment, which is assumed to be uniquely challenging for women rather than for men. One respondent reflected on her experience with discrimination in the workplace:

> When I worked in the boiler and turbine departments, it's heavy-duty jobs. We had more males than females, my section there were a few females. They knew very well that I couldn't do some things alone. I couldn't open the valve alone, meaning it's supposed to be teamwork. One day I just went there alone, and they knew very well; I couldn't do it alone. But everybody decided to just focus on what they were focusing. It was a night shift, so the manager had to leave his office and [come] down to help me to open those big valves. Some men would say things like, 'Why did you choose a job you know you can't handle?' That's when I also started thinking of, you know, doing something […] different with my career.

While respondents admitted that heavy equipment could often be a challenge for women, they argued that the expectation that women cannot do certain jobs is often disempowering to those wanting to do the work. Indeed, women in the sector are not monolithic. Hence, respondents suggested that greater consideration should be given to the unique capabilities and strengths of workers rather than their weaknesses.

> It's not untrue that the machines are heavy, but we sometimes disempower people by making assumptions about what they can or can't do. There could be solutions to accommodate women in that space, but those options aren't always considered.

In addition to workplace discrimination, interviews with women workers revealed an additional challenge outside of the workplace and in the communities in which they worked. In particular, young women often struggled to communicate with the male traditional leaders. In addition to gender, age appeared to be an additional barrier to gaining trust and respect in the community. Thus, patriarchy and paternalism remain a persistent challenge to women's participation in and leadership of the just transition. One respondent described her experience:

> … because you'll know that most of the community leaders, who I have to engage with, are male, old males. So, it's like, *lomntwana* (this child) and when you say something, it's taken as if you are disrespecting them because they are males, and they are elderly. So, I've received a lot of backlash for being disrespectful, for just trying to convey a message.

For many of the respondents, this gender imbalance was acknowledged as a perennial problem that will be replicated in the renewable energy sector if the structural causes of gender inequality in the industry and society are not addressed. One respondent who worked in many industries, coal and the renewable energy industries included, made this link explicit:

> There is nothing new in renewables or just energy transition, regardless of the new measurements and indices that we have. The renewable industry mirrors the monopolies in the economy as a whole … At one point there was a requirement for black women and BBBEE [Broad-based Black Economic Empowerment] in procurement, but the jobs they got were in leading HR [Human Resources] and Sustainability. Mostly it was companies already there, registered in the names of wives and mothers.[3]

Here, the respondent linked the industry structure to a larger, longer historical structure of the South African economy, and the longstanding, limited opportunities for women, particularly black women.

How this same structure is being replicated in the renewable energy sector was described by at least two respondents, both of whom had first-hand experience working in the sector. The bourgeoning renewable energy industry in South Africa is dominated by multinational firms.[4] In Rounds 1 to 3 of the Renewable Energy Independent Power Producers Procurement Program (RE IPPPP), taking the wind energy sector as an example, the lead engineering, procurement and construction firms were Nordex of Germany (500 megawatts), Siemens of Germany in a consortium with two South African firms (400 megawatts), Vestas of Denmark (370 megawatts), China Longyuan (270 megawatts), Suzlon of India (150 megawatts), Acciona of Spain with Aveng of South Africa (150 megawatts), Iberdrola of Spain with Group 5 of South Africa (less than 50 megawatts), and Basil Read of South Africa (less than 50 megawatts) (Baker and Sovacool 2017). In the solar sector, engineering, procurement and construction in Rounds 1 to 3 were dominated by American and European firms, the largest of which were Enel Green Power, Solar Reserve, and Scatec Solar. Since Round 3, globally, the renewable

[3] Interview via Microsoft Teams, May 16, 2024.
[4] The industry is defined here as firms producing wind energy, solar energy, green hydrogen, and electric vehicles, as well as organisations involved in renewable energy policy making.

energy industry has become dominated by fewer firms that are growing in size (Baker and Sovacool 2017).

These respondents also spoke of realising that the renewable energy sector was not committed to gender justice, and would likely reproduce the same types of gendered differences in access to opportunities:

> I understood that I was an idealist in a very political space. And so my eyes started to open up. When I went into the renewables industry, I had my eyes opened even more. Because there you don't have people who think about their energy, or their supply options as the virtuous good. They see it as a complete business opportunity. It's all about returns on investment. And they run the business like any other business. They are not interested in the kinds of things that we believe. Do we believe that renewable energy as an investment choice, really epitomised clean, you know, clean power, clean relations, better working conditions, all of these things, when I was advocating for it? And then I realised, actually this is, this is just business this, there's no real difference.[5]

This respondent, who worked for an organisation responsible for industrial policy, relayed how she was a part of a team that tried to implement a set of changes to meet transformation targets, such as appointing more women into leadership roles. However, these changes were often rejected by incumbent leadership. Some women also lost their jobs as a result of trying to lobby companies to meet their targets. Some respondents spoke of using different strategies to navigate difficult male-dominated meetings or spaces:

> I recognised the energy providers were there for returns, and I needed to speak in their terms to try and convince them about just energy transition. It was usually me alone as a black woman within a room of white males. My message was: it is possible to do good—transform the

[5] Interview via Microsoft Teams, May 30, 2024.

> industry to more local firms, community participation, and leadership transformation to include more women and blacks—and get a profit.[6]

These quotes capture important recurring themes among most of the interview participants. First, the respondents all believed strongly that business was not only meant for purposes of profit maximisation, but that businesses had an important, leading role to play in meeting transformational goals, such as hiring more women in leadership positions. The idea that businesses are separate from social goals has a long history within mainstream economics, which views firms/businesses' sole mandate as profit maximisation rather than as having a social role. However, as Nelson (2011, 27) articulates, businesses are organisations that are "embedded in complex situations and can in any given situation act morally or immorally, wisely or unwisely—just like any other human organisation".

Second, the respondents spoke to the structural nature of gendered differences in the energy sector that has become so entrenched that even the change of the resource, for example, from coal to renewables, is not a sufficient factor to change the dynamic. Rather, newer industries are able to better obscure the role that businesses must play in resolving gender power relations under the guise of the "newness" of the industry.

The next section delves into the intersectional discrimination experienced by women in the energy sector.

Intersectional Discrimination in the Industry

As alluded to in the excerpts above, all six energy professionals/entrepreneurs who were interviewed identified several identities, in addition to gender, as playing a part in their experiences of exclusion in the industry. Respondent 2 identified "the gender issue" as "layered", with the question of race and exclusion of black African women as central.[7]

[6] Interview via Microsoft Teams, May 30, 2024.
[7] Interview via Microsoft Teams, May 16, 2024.

Respondent 5, a business graduate who worked in a multinational energy firm, and now runs her own firm in the renewable energy industry, underlined class and race as perennial blind spots in just transition policy, particularly in the allocation of financial opportunities. She explained "the oneness syndrome", or widespread thinking in the sector that homogenises all women in South Africa, which she saw as a barrier to policy outcomes that were genuinely inclusive.[8]

Respondent 2 brought more dimension to the question of exclusion and start-up capital:

> As black entrepreneurs, we have little chance to become servicing companies to the mother companies [multinational firms] getting the IPPPPs. We all face barriers to get financing. Women, especially, don't have monies networks and can't rely on family for financial help. Only if we play the game, we have a chance of getting some servicing contracts, eventually.

When asked to define "playing the game", Respondent 2 provided a list of requirements that she described as "being a doormat" in the early stages of the IPPPP. The list includes earning no returns for a long period, incurring high debt, and tolerating a lack of access to information pertaining to contracts.[9]

Adding to race and gender, Respondent 4, a policy expert in the energy industry since 2006, included age as playing a role in exclusion. She provided the example of young women engineers rarely speaking in policy-related meetings, suggesting this may be due to an overbearing sense of hierarchy within organisations. Stressing the lack of networks and support as key to "traumatic experiences of being in minority", she observed that experiences of black women in this regard are similar to those of black men.[10]

Respondent 3 added sexuality to race, gender and class, highlighting that existing policies in her organisation did not take into account LGBTQI+ individuals. Respondent 3 specified that there may

[8] Interview via Microsoft Teams, May 30, 2024.
[9] Interview via Microsoft Teams, May 16, 2024.
[10] Interview via Microsoft Teams, May 23, 2024.

be varying measures needed to foster inclusion of different racialised, historically excluded groups in the South African context.[11]

Respondent 2 provided a perspective of achievements and challenges over time that illustrate the trajectory of institutionalised discrimination in the energy sector.

> If we look at the timeline, 2012/13 was the time of the first renewable energy projects. By 2019, women entrepreneurs and professionals had made formal demands for inclusion in the industry. In 2022, we saw the definition of just energy transition, and wider vision and aspirations for transition and transformation. Today there are some women in core technical and financial roles in the renewable industry. The industry had to be dragged to this point. But there are still very few women executives and continuing high preference to open up to women in non-core roles, like socio-economic impact assessment. Women are now reflecting on what has been achieved and where to go next.[12]

This section highlighted the different struggles that are experienced by women working in the energy sector, and how these struggles are shaped by structural power relations and axes of inequality (gender, race, geography, etc.). The next section further analyses the experiences of women in the energy sector by drawing on existing literature on gendered energy imaginaries.

Energy Imaginaries and Gendered Energy Imaginaries

The energy social sciences literature explores worldviews of energy professionals and how these shape their ideas on energy technology and energy systems. Building on this literature, Alda-Vidal and co-authors (2023) use the concept of "imaginaries" in relation to energy transition, arguing that different imaginaries reproduce or transform existing inequalities by enabling or curtailing access to energy for different groups. According to these authors, literature focusing on the global South highlights that

[11] Interview, Johannesburg, May 22, 2024.
[12] Interview via Microsoft Teams, May 16, 2024.

diverse actors shape differing energy imaginaries, with conflicting imaginaries clashing and coexisting in national policy arenas (Alda-Vidal et al. 2023).

Alda-Vidal and co-authors propose "gendered energy imaginaries", arguing that little work has been done on gender perspectives that shape professional and institutional spheres and, in turn, socio-technological pathways to sustainable, or not-so-sustainable, energy futures (Alda-Vidal et al. 2023). They outline two archetypes at the extremes of a single spectrum: the "gender-neutral grid imaginary", and the "gender-aware decentralised development imaginary". As the spectrum is singular, these archetypes are not mutually exclusive. They do, however, differ in the socio-technological pathways they entail. These have implications for gender equity and inclusivity.

The concept and spectrum of gendered energy imaginaries is useful to understand the views of the six key respondents interviewed. Also useful is the assertion of Shannon Bell and co-authors (2020), that a gender approach to energy widens the aperture to shed light beyond the categories of "women", "gender equality" and "economic empowerment". Similarly, focusing on South Africa, Jon Phillips and Saska Petrova (2021) argue that a feminist approach considers a range of underlying power asymmetries in existing energy systems, thus shedding light on race, space, history, as well as gender. All key respondents interviewed expressed energy imaginaries closer along the spectrum to the gender-aware decentralised development imaginary archetype, drawing links between energy, the environment, and socio-economics.

Respondent 1 is Chief Director in a government department active in energy technology development in South Africa, with a doctorate in flow dynamics (applied mathematics). She presented an energy imaginary that included issues of training, employment and gender, which was grounded in the needs of the majority and was politically practical:

> I introduced a green hydrogen powered fuel cell for a military hospital during Covid. We held a train-the-trainers course in a TVET [technical and vocational education and training] over six weeks, with the energy and water SETA (Sector Education and Training Authority). There were a total of 40 students in two cohorts, with 60% women. The course is now registered with SAQA (South Africa Qualifications Authority). I have initiated a similar collaboration with the

> private sector. Job creation makes energy transition credible, but this is not the core mandate of the Department. I am trying to change the thinking around the training. Not just increase the number of credentials granted, but to absorb trainees into jobs.[13]

The contrast between "bread and butter" concerns of the majority and energy transition as discussed in policy circles was underlined by Respondent 4. Describing herself as a policy expert who began working on energy at a time when "energy efficiency was a new issue, and not driven by loadshedding or climate change", Respondent 4 pointed out the following when asked to compare current energy policy discussions to those of the early 2000s:

> Business is driven by incentives, still; profitability rather than caring for the environment. But now, there is more proximity in the language used by scientists, business and government. For example, scientists used to say 'uncertainty', and business couldn't understand the idea, until we began using the word 'risk'. But there is still inadequate analysis linking, for example, the impacts of war on climate and environment … What is more typical is compromise positions, for example, what happens at COP (Conference of the Parties). People, consumers, are not well incorporated in these discussions, and bread and butter needs are still their concern, regardless of the environment.[14]

When probed for her vision of a green economy, Respondent 4 responded that if done with speed, transition to a green economy would open up space for women:

> Lots more industrial and production engineers are needed, who can come up with techniques for using and making biodegradable materials, recycling, and recycled materials. People like me, problem solvers, marketers, coordinators, are also needed, and must be integrated in new green jobs … Another missing piece is small and medium enterprises, for example family-owned businesses. How they can become more energy efficient.

[13] Interview via Microsoft Teams, May 13, 2024.
[14] Interview via Microsoft Team, May 23, 2024.

In varying ways, Respondents 5, 3 and 2 named issues of non-urban communities as part of the problem of new energy pathways and inclusive energy futures-in-the-making. Respondent 2 did so in the form of a question regarding the current study:

> The construction of new energy generation projects is happening mainly in the Northern and Eastern Cape, but what about Mpumalanga, where people are losing jobs and many communities never had proper access to energy to begin with. What is being done there?

Respondent 5 was more elaborate, putting it as follows:

> I am harnessing on-the-ground intellect to shape processes that shape policy, for example through focus groups with communities, and compiling needs analyses. My business is about to launch a new project to bring voices of communities to companies getting contracts through the IPPPP. Opening lines of communication in various projects between companies, municipal offices, and communities. It is a facility to help companies be more responsive to community needs … For example, a community that needs more mortuary fridges. We are now making this facility a must for all companies contracting us for socio-economic impact assessments of their projects.[15]

Not shying away from the complexities of a just energy transition, Respondent 3 raised the needs of communities affected by new mineral extraction that may arise in Africa as a whole as part of her imaginary, which includes processing and manufacturing within Africa key minerals for energy transition:

> The African Continental Free Trade Area is crucial for beneficiation of key minerals for energy transition in Africa. Then we import only the casings for electric car batteries, for example, versus now, which is the opposite. At present South Africa only puts casings on the chemistry that is imported. What we need to do is build local technology for the chemistry, small scale

[15] Interview via Microsoft Teams, May 30, 2024.

> initially. But workers don't have all the skills needed … And then we must also look after rural communities that will suffer from new and more mining.[16]

Respondent 6 identified the clash between the BBBEE energy imaginary that she nurtured in the industry association she was leading, and that of the most powerful corporates and the South African state. In many ways, this clash resonates with research on Senegal, which shows how visions of the corporate North dominate a technology-driven energy transition in Senegal, and excludes local histories as well as definitions of societal benefit (Simmet 2018).

> I feel my efforts had little success, though an industry commitment agreement was launched. Many in the corporates agreed, C-suite people, that is, but the opposing force won … the multinationals with the most influence and votes at the board level and in the working groups. They were completely opposed to local procurement. The Minister of the time, Gwede Mantashe, agreed with the transformation targets, but not on local procurement because he feared the manipulations of certain OMs [Operation and Maintenance, or multinational firms engaged in renewable energy plant operation contracts]. So instead, he focused on cost competitiveness in the bid price. This, perversely, led to multinationals arguing that in order to meet price targets, transformation features such as local ownership targets needed to be reduced.[17]

It is clear that many of the women working in the energy sector can see opportunities to address broader environmental and economic issues within the transition but struggle with the narrow views of just transition. The next section outlines how existing energy imaginaries are shaped by structural factors and gender norms.

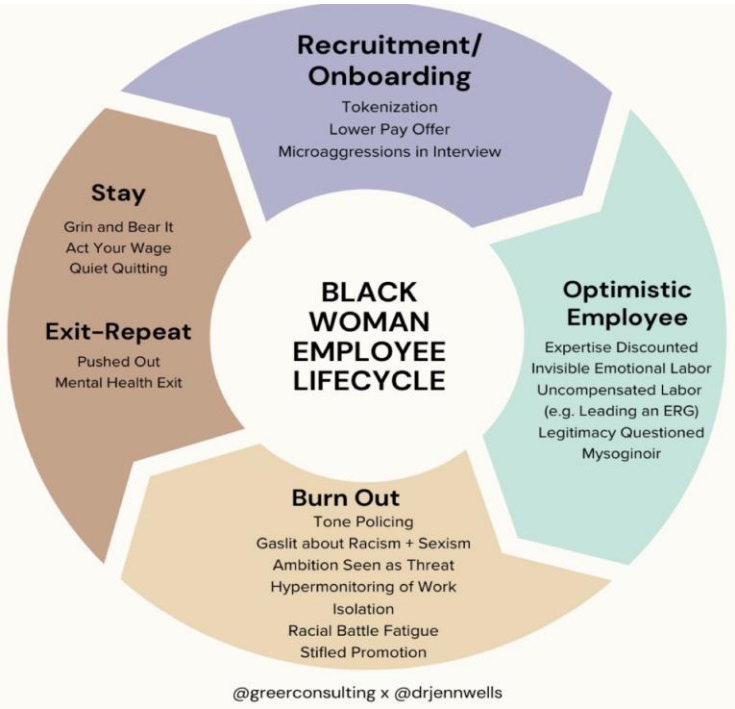
Personal Work Experiences

A look at experiences of patriarchy, racism and exclusion at work concludes this analysis of women professionals and entrepreneurs in the renewable energy industry in South Africa.

[16] Interview, Johannesburg, May 22, 2024.
[17] Interview via Microsoft Teams, May 30, 2024.

DEI (diversity, equity and inclusion) experts Marissiko Wheaton-Greer and Jenn Wells (2024) offer "The Black Woman Employee Lifecycle" consisting of categories that describe the cyclical experience of professional African American women at work.

Figure 20: Black Women Employee Lifecycle



Source: Wheateon-Greer and Wells 2024

Although designed in and for an American context, the categories of the cycle are helpful to discuss patriarchy and racism faced by professional black women in South Africa. In this study, 'black' is defined broadly to include racialised women of all historically excluded groups in the South African context. Black women professionals in South Africa face challenges similar to those of African American women professionals in the USA, given that both groups find themselves in professional spaces dominated by white men.

Beginning with the "Optimistic Employee" phase, all key respondents spoke of a range of experiences in which their expertise was discounted, their legitimacy questioned, their having to perform invisible

emotional labour or/and uncompensated labour, and misogynoir, or the combined experience of ingrained prejudice against women and anti-black racism.[18]

Respondent 3 recounted being employed as a policy expert within the organisation for 23 years—longer than any other employee in the unit—but still not being promoted to a leadership position. Recent to the interview, though being the sole staff in the unit, a male employee, without her level of expertise, was seconded to lead the unit. As she phrases it, "Unskilled white men still take priority over black skilled women with regard to promotions and recognition".[19]

Along the same lines, Respondent 6 spoke of "unspoken barriers" that are ongoing in the renewable energy industry:

> Black women and men are seldom cited as experts. There is an entrenched trust in white male professionals. Middle and upper-level black professionals in my networks are constantly denied promotions and have to fight every day just for recognition. Board memberships and awards are given to very few blacks. It is predominantly white men and some white women on boards. And a subtle exclusion is the way jobs are advertised and written. The adverts are not circulated widely … and tend to not include salary information and other career details, which black professionals need to make decisions about applying. They have financial and family responsibilities, which means they must have full information to weight the pros and cons of changing jobs.[20]

Respondent 1 spoke of having her expertise discounted when critiquing a principal element of a research consortium proposal. The university-based primary investigator responded to her critique with rudeness. Her subordinate reported to her that in a subsequent meeting, the same critique was made, without reference to her intervention. Eventually, the flawed proposal was revised and the primary investigator replaced. Respondent 1 highlighted, however, that without the power to approve

[18] Recruitment information was not collected for this study.
[19] Interview, Johannesburg, May 22, 2024.
[20] Interview via Microsoft Teams, May 30, 2024.

and disapprove research project funding, her expert knowledge would likely not have carried such weight.[21]

Respondent 2 shared the experience of a colleague who exemplifies the latter point highlighted by Respondent 1. Knowing her insight would not be considered, a black woman energy engineer strategised around how much expertise to share in advance. Once the endeavour failed, she then demonstrated the validity of her insight.[22]

Respondent 5's account of resignation from a full-time position in a multinational renewable energy firm, one that she had held for four years, fits well with the "Burnout" and "Exit-Repeat/Stay" phases. It also tells of misogynoir, intertwined with consistent discounting of the inclusive energy imaginary she was proposing as a business policy professional.

> I did a lot of stakeholder engagement with landowners. There were lots of power dynamics, like I had to engage with landowners but not communities also living in the affected areas. Communities were an afterthought. I always raised these issues and made some headway. But after my Europe-based superiors left, I faced racism and sexism from my white male superiors … I quit after the birth of my child, when I realised I had no more stomach for it.[23]

Three out of six respondents reported exiting positions due to some form of frustration or distress. Rather than enduring "being a doormat" to "mother companies", Respondent 2 opted to leave the renewable energy industry to start a business operating in several industries, across the value chain, thus production, supply of goods, and advisory work. She also spoke of work in renewables being "intense", usually taking place for several weeks in rural areas, where "accommodation is booked in small hotels or guest houses and 17 out of 20 rooms are for men".[24]

[21] Interview via Microsoft Teams, May 13, 2024.
[22] Interview via Microsoft Teams, May 16, 2024.
[23] Interview via Microsoft Teams, May 30, 2024.
[24] Interview via Microsoft Teams, May 16, 2024.

After almost a decade of building up some capital through entrepreneurial work, Respondent 2 is hoping to return to the renewable energy industry and invest the accumulated funds in projects she feels are crucial. Financing will soon become a problem again, however, because "to move up and capitalise we will need partners, and development finance carries higher interest than commercial banks, which is already costly".[25]

Respondent 6 spoke of accomplishing a major policy goal as chair of an energy association, and concurrently making the realisation that her position was in danger, largely because of the accomplishment. The experience has since shaped her career choices. In her words:

> Though we launched the industry commitment agreement, I had a gun to my back, I realised. I had to hire a lawyer to negotiate my way out of my job. This is how I was able to take a one-year sabbatical … I am a single mum and have certain values about work and my children. I always make time for my children. I have three. I work when they sleep and I choose jobs that are near where I live. Now I accept my career limits: I only try for junior level jobs.[26]

This experience provides an introduction to the next section on family responsibility and care work for many women in the energy sector.

Family Responsibility and the Disproportionate Burden of Care

Interviews with women in the energy sector also revealed gendered barriers beyond the workplace. In particular, unpaid care work was identified as a key source of vulnerability for women workers in the sector. Due to traditional gender norms, women tend to be responsible for the majority of care work in the home. Women also face additional challenges due to pregnancy, which may lead to further restrictions depending on the type of work they are engaged in. As a result, women's participation in the energy sector requires the balancing of two equally demanding jobs, paid work in the labour market and unpaid care work in the home. Most respondents noted the importance of family support in managing their roles as mothers and as professionals in the energy sector. Further, beyond the

[25] Interview via Microsoft Teams, May 16, 2024.
[26] Interview via Microsoft Teams, May 30 2024.

measures taken at a family or household level, respondents highlighted the need for institutional measures to protect women against discrimination in the workplace and promote women's participation in the sector regardless of their identities as mothers. One respondent recounted her experience:

> You do encounter individuals who have their own biases. Some managers might be anti-motherhood. One of my previous managers had a problem with women going on maternity leave. He made it clear that he didn't like the fact that women would go out and get pregnant. When I was pregnant, even though I was married, I felt like I had to explain myself to him [...] I was doing well at work, and I knew he liked the way I did things. So, when I found out I was pregnant, I thought, Yoh! My kingdom is going to come crashing down, but Eskom's processes are in place to protect women.

Studies suggest several examples of promoting decent work in the economy and of supporting women workers in particular. Chief among these is the importance of work-based social protections and universal access to social services, such as healthcare. When social protections such as paid sick leave, maternity benefits, medical aid or health insurance are not provided for by the state or by the job, it is women who often bear the economic and social costs related to the provision of unpaid care in the households or in the community (Mhlana 2023). Therefore, work-based social protections are critical to advancing efforts towards gender equality in the economy and to promoting a truly just transition in the South African energy sector. The following account illustrates what institutional support might look like based on one respondent's experience of working while pregnant at the national energy provider:

> The Medical Centre explained to me that due to the nature of the plant and its vibrations, I couldn't work on-site anymore. Instead, I was given office-based duties. While I missed being in the plant, it felt like punishment. My manager helped me adjust my role. I analysed reports and stayed involved in plant activities through paperwork. Eskom made sure my safety and the safety of my baby were priorities, and I really appreciated that.

Two other key respondents also raised the question of children, mothering, and work. Respondent 2 spoke of being unmarried and without a child as "an advantage", while also acknowledging that the situation was "unfair". She added that she had often stepped in to care for a colleague's son when her colleague was occupied at work. Respondent 2 mentioned how her colleague "couldn't wait to ship him off to boarding school" once the child had completed primary school.[27]

Despite having or being able to afford paid care for their children, as with Respondent 6 above, the respondents expressed clear limits in trade-offs they were willing to make between mothering and paid care, as well as mothering and career advancement. Respondent 1 put it like this:

> When I worked in the Department of Energy as a level 13 specialist, the admin work was done by two of six specialists, myself and a man, because there was no director. I spent the day on hirings, reports to committees … Nights I spent on technical work: running models, developing policy, after making sure my two kids were finished their homework and settled into bed. I drew the line at weekends. I didn't take homework from my job on the weekend … A job is a job, but motherhood work is for eternity.[28]

Finally, with regard to emotional and other uncompensated labour, most of the respondents were passionate, rather than negative, about performing such work. This was perceived as part of the daily justice they practised within larger visions of gender just transition and socio-economic transformation, and may be particular to the South African context.

Respondent 4 talked about her belief in "working intergenerationally", which included how she arranged seating in the office. "Young and old need to interact," she asserted, "because learning by doing is important, and sitting close in an open setting facilitates this."

Respondent 4 was also contemplating starting a broad women's network to build collective mutual support.[29] Respondent 6 committed time, while studying for a Master's degree, to create cohesion

[27] Interview via Microsoft Teams, May 16, 2024.
[28] Interview via Microsoft Teams, May 13, 2024.
[29] Interview via Microsoft Teams, May 23, 2024.

among non-profit organisations engaged in energy policy research.[30] Respondent 1, who had four directors reporting to her, one of whom was a woman, spoke of making time to meet weekly with the female director. This was to help support and prepare her for a promotion. In greater detail, she noted the following:

> I worked with a lot of feelings … Spending time with women professionals is key, particularly in times of transition, like promotions and pregnancy. When I met with my managers, I would tell them what my subordinates were going through, and ask them things like "How can we support this woman who has had three miscarriages?" My manager shares my values and is my champion, so this type of advocacy tended to be smoothly accepted. In this sense I had prior privilege. [31]

Key Takeaways

The above analysis of the interviews conducted with women in the energy sector illustrates how gendered social norms play out in the workplace, particularly in an industry that is historically male dominated. This section highlighted the structural barriers to women entering and remaining in the energy sector, which include the following:

- The energy sector is not broadly perceived as suitable for women as it is male dominated, and the physical strength requirements are assumed to exclude women from these jobs. Importantly, these patriarchal ideas have carried through into renewable energy companies, where women also experience discrimination and stereotypes around gender. This male-dominated culture creates an exclusionary environment that is unwelcoming for women.
- As demonstrated, discrimination is clearly intersectional, with race, class, sexuality, and age also contributing to these experiences in the workplace. These prejudices are expressed in who is promoted and whose voice and views are heard.
- There is also an ongoing burden of care and pregnancy—where women have faced exclusion due to their need for maternity leave and too often account for the needs of their family or children.

[30] Interview via Microsoft Teams, May 30, 2024.
[31] Interview via Microsoft Teams, May 13 2024.

Limited access to parental leave, flexible work arrangements, and childcare support, for example, make it difficult for women to remain in the sector.

Evaluating the Social and Economic Impacts of the Energy Transition in Komati Village, Mpumalanga Province

This section provides an overview of the gendered impacts of energy transitions based on a case study of the community of Komati Village, Mpumalanga. Between 2018 and 2022, Eskom began decommissioning some of their oldest power plants in Mpumalanga province. Nine of the generators that were removed from operation were located at Komati power station, one of the oldest coal-fired power stations in Steve Tshwete Municipality. The surrounding area of Komati has been a key area of support for just energy transition projects, including a USD 497 million project funded by the World Bank Group. The community of Komati thus makes an appropriate case study for evaluating the just energy transition implementation plan in South Africa and the impacts of power plant closures.

The case study used a household questionnaire followed by two focus groups. The focus groups' composition was biased towards women to highlight the gendered impact of the power station closure.

Community Demographics

Almost all of the survey respondents (97%) were born in South Africa, but it was clear that many people had migrated to Komati from other parts of the country, mostly in search of the economic opportunities offered by the power station and related industries.

Education levels among respondents were generally low: more than 40% of respondents did not have a Grade 12 with university acceptance, and only 35% had any kind of post-school qualification.

Table 3: Highest Level of Education in the Household

Qualification	Number of households	Percentage (%)
Grade 1–Grade10	3	6.9
Grade10–Grade 11	9	20.9
Attended Grade 12 but did not complete	2	4.6
Grade 12 without university acceptance	4	9.3
Grade 12 with university acceptance	5	11.6
Diploma with Standard 10/ Grade 12	7	16.2
Certificate with Standard 10/ Grade 12	3	6.9
Diploma with Standard 10/ Grade 12	1	2.3
Bachelor's degree	4	9.3
BTech	4	9.3

The generally low level of education suggests that many Komati community members may be in a poor position to gain employment in many of the proposed new developments around renewable energy.

Employment

Unemployment levels in the community are high as a direct result of the closure of Komati power station and the corresponding decline in economic activity. Only 39% of respondents classified themselves as paid employees, and a significant number of these people worked in the informal sector. Fewer than 20% of respondents worked in the formal sector. Almost 30% of respondents were unemployed, and the majority of these were women.

The survey found that employment did not always correspond to a regular wage. Some of the respondents who considered themselves employed had not earned a wage in the seven days preceding the survey, largely because they were employed in the informal sector or as domestic workers on a non-permanent basis. This finding highlights the precarious nature of livelihoods even among those classified as "employed". Once again, women were overrepresented in the category of people whose wages were uncertain.

Respondents who reported that they operated a business for themselves were engaged in several activities, including general retail trading, running a day care centre and running a tavern.

Unskilled workers reported working as domestic workers in Komati Village, as security guards at the mines and as supermarket packers at a local retail outlet. In government institutions, women worked mostly in cleaning jobs, while the men were responsible for maintaining the gardens.

The skilled workers who participated in the survey reported that they mostly worked for the state, the power utility, or in the coal sector. The main employers were:

- Department of Home Affairs
- Department of Education
- Steve Tshwete Local Municipality
- Eskom
- SASOL
- Thungela Coal Mining
- Cotecna Ubembe Coal testing laboratories

- Actom (supplier of electrical equipment and services)
- Naboti mine
- Enprotec Engineering services
- SDG laboratories.

There was at least one member who worked in the coal sector in the 25% of the households that participated in the survey. Furthermore, an additional 30% of the households derived livelihoods indirectly from a coal mine, a power plant, or the coal transport business.[32] This emphasises the importance of the coal sector and coal-fired electricity generation in supporting better-paid and more secure employment in the community. It also indicated that more than half of all households had livelihoods linked to the coal sector.

Although men and women technically have equal access to employment opportunities in the coal and mining sectors, participants in the focus groups indicated that women were not allowed to work with the coal excavators as this was considered too dangerous. Women generally occupied the less skilled roles in the mines, and thus earned a lower wage than men.

The focus groups revealed the perception of racial discrimination in the mines where white persons occupied senior positions while black people were the junior employees. A further example put forward of this discrimination was that the primary school in Komati only employs white teachers.

Discussions further highlighted that most of those who were employed felt that they did not have autonomy to make decisions at work. This was attributed to difficulties securing employment, and the precariousness of much employment. The oversupply of (particularly unskilled) labour in the market meant that respondents traded off their autonomy to focus on securing a job and an income.

Care work was shown to be important for reproduction in most households, although the amount of care work varied and was determined by the size of the household, the presence of aged and/or sick

[32] Such as selling food to coal truck drivers, renting out accommodation to contractors, or working as a domestic worker for someone who worked in the coal sector.

adults and the presence of young children. Of the households surveyed, 86% had children, but there were children in the group who were old enough to take care of themselves. Young children were mostly cared for by one of their parents, although grandmothers, sisters and brothers were also reported to be caring for children.

In Komati Village, schooling is free for children who attend government primary and secondary school, but nursery schools and daycare centres must be paid for. The survey indicated a very wide range of spending on this service, between R70 and R4,500 per month in fees.

Three quarters of the respondents spent some hours caring for an adult in their household. Most of the respondents who cared for an adult generally spent an hour a day doing so.

Impact of the Power Station Closure

A significant number of community members reported having limited knowledge about the energy transition, or the details of how it would impact their lives (irrespective of the fact that it had already directly impacted many of their lives). However, they expressed apprehension that the transition would lead to the following:

- closure of the coal mines, which are currently their main source of livelihood;
- reduced employment opportunities for the youth;
- increased redundancy of skilled workers, because most skills that people possess in Komati are aligned to the coal sector and coal value chain;
- increased crime in the village;
- increased cost of household electricity;
- uncertainty about the reliability of alternative sources of energy for household supply.

The closure of the power station has already placed many livelihoods under strain. Approximately 50% of the households had experienced a change in their employment status and economic activity level and type in the previous three years, because of the Komati shutdown. Most of these changes

were for the worse and included the changing of jobs (often to more precarious and less well-paid employment), loss of employment entirely, and establishing a small business as a survival strategy.

Very few people were able to find similar replacement jobs because employment opportunities were reduced significantly as power generation-related companies also closed or downsized. One impact of the declining local economy was that many of the business that remained reportedly increased their prices. This put further pressure on the declining disposable income of the community.

As a result, Komati community members have been forced to adopt a range of coping strategies, with varying degrees of success. The main coping strategies adopted were the following:

- removing children from expensive private schools to cheaper government schools;
- diversifying household power to gas and firewood;
- relocating the whole or part of the family;
- subletting rooms in the family house;
- starting a business on residential premises to generate extra income.

Relocation has been a key coping strategy with a significant number of people having moved away: 74% of the households reported that they were aware of neighbours and friends who had left the settlement following the closure of the power plant.

Some of the higher skilled people who lost their jobs set up home businesses, such as car repairs, hair salons, or providing electricity and plumbing repair services to members of the community. Others ventured into the transport business to provide transport for the community members who had no means of mobility following the withdrawal of Eskom subsidised transport. There were, however, several skilled workers who were struggling to find employment and/or secure their livelihoods in the village of Komati. Some had registered with the contractors and mines while others had resorted to doing casual work in the community. Women were more likely to cope by selling food in the informal sector, performing domestic work, or providing hairdressing services and casual domestic work. The men who were more used to holding longer term employment opportunities than women struggled

to generate casual income and were more likely to try and seek similar income to their previous employment.

Some of the community members had found work on short contracts ranging from three to six months. These jobs included maintaining the parks, cutting grass or cleaning the mothballed power station. These opportunities did not provide job security and were generally combined with long periods of unemployment.

Unsurprisingly, against this background, many respondents reported very low income and remittances, and social grants were important sources of income. More than 40% of the households surveyed reported that they did not receive any income from employment. Many of the unemployed women relied on remittances from their children who were employed somewhere, while others relied solely on social grants and/or pensions.

Table 4: Income

Monthly (annual)	Number of households	Percentage (%) of households
No income	19	44
R1-R400 (R1-R4 800)	1	2
R401-R800 (R4 801-R9 600)	1	2
R801 - R1 600 (R9 601 -R19 200)	1	2
R1 601 - R3 200 (R19 201-36 400)	1	2
R3 201 -R6 400 (R36 401-R76 800)	4	9
R6 401 - R12 800 (R76 801 - R153 600)	4	9
12 801 - R25 600 (R153 601 - R307 200)	5	12
R25 601 - R51 200 (R307 201 - R614 400)	1	2
Response not given	4	9

Access to Services

In many respects—and despite high poverty and low income—households in Komati have access to good services. This is due almost entirely to the presence of the Komati power station, which

emphasises the importance of Eskom in providing not just employment opportunities, but also a range of other goods and services that have contributed to relatively high standards of living. Gradually, these are likely to be lost or to deteriorate unless maintaining or replacing them is included in just energy transition policies.

The focus of ameliorative action under South Africa's just energy transition has, to date, been mainly on employment in the coal value chain: how to reskill workers and create new jobs to replace those that have been (or will be) lost as a result of the closure of coal-fired power stations, and the resulting decline in domestic demand for coal. Comparatively, little attention has been paid to the issue of the community services provided by power stations and coal mines, and the impact on communities of the loss of these services. As a result, there are no detailed plans or funding to address this issue. Although the Eskom-commissioned report "Socio-economic impact study for the shut down and repurposing of Komati power station"[33] highlights these issues, to date this has not been translated into specific projects to fill the gaps left in community services.

The houses in Komati Village are all brick and mortar, and were constructed by Eskom. All households have a flush toilet that is located inside the house, and all households in the village have access to high quality drinking water (produced by Eskom at the power station) that is piped to the households.

All households have access to electricity, although 23% of the households also used gas and firewood because the electricity was deemed expensive. Respondents indicated that the quality of electricity supply was very high, and that they never experienced power outages.

There is, however, no healthcare facility in Komati Village. The community relies on a mobile clinic that visits once a week. The community members who need to visit a hospital must travel to Middleburg, which is 40km away. Those who used the government hospital and the mobile clinic did not pay for the service as it is provided for free by the state.

[33] https://www.eskom.co.za/wp-content/uploads/2022/11/Komati_SEIA_Final_Integrated_Report_October_2022.pdf

South Africa's Free Basic Services Policy aims to provide a limited amount of each service each month to qualifying households: 50kWh of electricity, 6KL of water and a range of basic sanitation options, with the details of the latter to be determined by each municipality. However, in order to obtain the services, households must be registered as indigent by the local municipality. Each municipality has the responsibility and sole discretion to determine its own criteria for household indigent status.

Municipalities are not required to fund the free basic services out of their own revenue. There is an annual allocation in the national budget to each municipality in respect of these services, which forms part of the local government discretionary equitable share allocation. Each year, the number of qualifying households (which is roughly equitable to households living below the upper bound poverty line) in each municipality is estimated by National Treasury, with input from Statistics SA, using adjusted household income data from the 2011 census and the 2016 community survey.

Far fewer households than the municipality has received funding for actually receive the package of free basic services, particularly electricity.[34] Emalahleni Local Municipality received funding from National Treasury in 2022 for 84,203 households to receive free basic services but only had 5,655 registered indigent households (i.e. 6.7% of the funded amount) who were the actual recipients of these services.

The situation in Steve Tshwete Local Municipality is a little better, but still far from what is required. Registered indigent households in 2022 were approximately 11,000 (slightly up from the previous year). This can be compared to the equitable share allocation for 2022, which was intended to fund 48,570, implying that 22.6% of intended beneficiaries received services.

Key Takeaways

This analysis has shown that in the coal mining area of Komati, the effects of the energy transition are dire. The results from the household survey show high levels of unemployment, where women are

[34] https://pari.org.za/wp-content/uploads/2021/04/broken-promises21-04-21c.pdf

disproportionately represented in both unemployment and low-skilled work. As a central livelihood source, the loss of the coal mine has resulted in direct changes in the composition and organisation of the surrounding households. More than half of the households surveyed experienced loss of income and employment, further straining household incomes. As a result, a number of coping strategies were used in households, including relocating to more affordable housing, cutting already strained household expenses, and some even resorting to starting informal household businesses to subsidise the loss of income.

While Komati has historically provided adequate public infrastructure, surrounding communities expressed concern about the continuation of these facilities in the absence of the Komati power station. Municipalities such as Emalahleni, which are struggling with limited capacity and financial resources, now face the challenge of covering these services, which often include water, waste management, and electricity. The cessation of these services in "tied settlements" historically serviced by Komati could significantly worsen living standards. Another limiting factor is the Free Basic Services Policy, which is meant to provide minimal resources to impoverished households, yet many eligible families are left without services due to misaligned municipal policies and discretionary funding allocations.

This has significant gender implications as studies suggest that women are most vulnerable to the effects of a lack of access to social protections and social services (Mhlana 2023). At the same time, women are the primary persons responsible for social reproduction in the home and the community. With reduced access to services, we can expect the time spent on social reproduction activities such as the preparation of food and the collection of water and fuel for the household to increase. Moreover, with persistent gender norms, women will be likely to bear the brunt of the increased burden of work in the home, but their vulnerability will likely not be contained in the domestic sphere alone. Indeed, studies suggest that social reproduction remains a barrier to women's equal participation in the labour market. As a result, women may be forced to work less or exit employment when social services or social protections are not provided (Mhlana 2023). This will have significant adverse implications on the incomes of women in the labour market and on the overall health and well-being of society.

The following section offers some recommendations for a gender just transition.

Key Recommendations for Policymakers

The findings presented in this report suggest several limitations in existing policies for the inclusion of women, workers and households in the just energy transition. While existing plans recognise the importance of including historically marginalised groups, such as women, youth and disenfranchised communities, in the just energy transition, very little attention is paid to the kinds of policies that are required to support the inclusion of these groups from the household level and beyond. Further, where women and communities are mentioned, proposals are often limited to the characteristics of labour, such as reskilling, upskilling and developing new skills for new energy jobs, with no recognition of the persistent historical and structural challenges that individuals and communities face. As a result, existing proposals for a just energy transition are unlikely to reach the most vulnerable members of society who are already disproportionately impacted by climate-related risks and are likely to face even greater risks due to the anticipated threat on livelihoods that the energy transition is likely to create. Hence, this section presents some recommendations for advancing gender equality for a just energy transition, based on an evaluation of the key trends and challenges in the South African energy sector outlined in this report.

Skills Training

Existing policies highlight the need to improve the supply of labour for the implementation of the just energy transition. Since the majority of jobs in the sector are currently semi-skilled jobs, skills training is critical to ensuring that a skilled supply of labour will be available for future jobs in the sector. Further, skills matching is required to ensure that existing skills can be transferable to other sectors should they become redundant in the energy sector. However, it is worth noting that current discussions on skills are often limited to proposals about new skills for future jobs and the attainment of qualifications at the post-school level. This suggests a lack of awareness of the crisis of employment and the constraints of the South African labour market. Indeed, the challenge of labour in South Africa is not simply a matter of the quality of the supply of labour, but deeper structural issues that have allowed for the racialised and gendered legacies of apartheid to persist. In order to address the broader

challenge of unemployment and inequality in South Africa, skills training must also account for the needs of communities at the earlier levels of the education system, such as ensuring free basic education, quality infrastructure, transport and adequate resourcing of schools in disenfranchised areas. It is also important that investment is prioritised in sectors where women make up the majority of the workforce. This can be achieved by first conducting a thorough analysis that identifies sectors or industries where women have historically dominated the workforce, such as in healthcare, education, social services, agriculture and also the informal economy.

Access to Services

As previously mentioned, the energy sector is responsible for the provision of many social services in the coal mining towns where they operate. There is a serious risk that the decommissioning of coal mines and power plants will lead to reduced access to services for individual recipients and communities in these areas.

In the case of Komati, the inability to access free services contributes to household poverty, since households must pay for these services out of household income. The poorer the household, the greater the impact. One of the stated objectives of the just energy transition—and the Presidential Climate Commission (PCC)'s own strategy for the electricity sector—is to ensure that all poor households receive their free basic electricity. The PCC should engage with local municipalities to improve the delivery of all free basic services so that the number of beneficiary households more accurately reflects actual poverty levels.

Government should also ensure that the transition will not leave communities destitute and with no access to adequate social services. Therefore, the continuation of services should be included in the decommissioning plans and prioritised in local and national budgets. In addition, wholescale re-allocation of key services provision (such as water) to local municipalities needs to be carefully assessed and innovative solutions should be supported to ensure that the quality of infrastructure (and services) will be maintained.

In respect of the poor implementation of the Free Basic Services Policy, this is a situation that is currently under review by National Treasury, which is investigating various policy responses as part of the review of the Local Government Fiscal Framework. It is anticipated that these will be published early in 2026.

Support for Small, Medium and Micro Enterprises (SMMEs)

Existing policies emphasise nurturing entrepreneurship and empowering small businesses for the inclusion of women, youth and historically disenfranchised groups in the just energy transition. As with many proposals targeted at small, medium and micro enterprises, the assumption is that this will support local economic diversification, promote job creation and reduce dependence on foreign industries. Since women in the energy sector face significant structural barriers, including access to credit, women entrepreneurs are likely to benefit from such schemes. However, due to the size of South Africa's SMME sector, women own account workers and informal enterprises would not be covered. The intersection of gender and class in these proposals risks penalising the very poor and disenfranchised women it seeks to target. Therefore, donors and policymakers should develop programmes that support the informal economy as integral to achieving a just energy transition. This includes providing training to support activities in the informal economy, ensuring access to quality social services for informal workers, and expanding access to credit and/or loans at favourable interest rates to support the lives and livelihoods of informal workers.

Employment

Existing plans highlight the importance of targeting job creation in areas where former coal sector workers live. Since men are disproportionately represented in both the coal mining and electricity industry, targeting job creation in these areas without addressing the significant gender issues highlighted in this report will likely not lead to greater inclusion of women in the sector or in leadership positions as intended. Further, while the energy transition presents many opportunities for future jobs in the sector, the creation of new jobs that could benefit a significant proportion of the South African labour force is a vision that will likely only be realised over the long term. Therefore, immediate policies for employment should prioritise quality over quantity, the protection of workers' rights and

the expansion of employment-based legal and social protections in the South African labour market. Finally, there are several studies that point to the effectiveness of employment guarantee schemes in addressing the challenges of both unemployment and underemployment in the economy. Policymakers should work together with the private sector to create jobs that match not only future skills requirements, but also the existing skills of the current labour force. Furthermore, job creation outside of the energy sector must also be considered if the aim is to create decent work.

Early and Frequent Communication with Community Leaders, Contractors and Workers on Energy Transitions

Managing expectations is a crucial aspect of an energy transition, particularly for affected staff and communities whose livelihoods depend on the coal industry. This requires early planning and frequent communication with affected parties prior to the decommissioning of plants. The need for timely and regular communication was also highlighted by Komati residents, who felt uninformed about the transition, as well as by municipal officials, who noted they lacked sufficient information to address resident inquiries. As such, communities must be an integral part of the transition through early and transparent communication and engagements with the government. Translation of communication from the government must also be provided for communities whose first language is not English to ensure wide accessibility of information. In some instances where community leaders are mostly men, it is especially crucial that women, youth and unions are purposively included and encouraged to attend community meetings.

Government-Funded Income Support and Social Protection to Affected Communities

To buffer the financial effects of plant decommissioning, the government should subsidise loss in incomes of affected households. This is crucial to supporting livelihoods and would particularly support women-headed households in coping with income losses. The government has an important role to play in instituting social protection for affected communities, such as setting up social assistance programmes and direct cash transfers to affected households. National and local governments must also prioritise access to finance, technical support, and markets for women-owned businesses, especially in sectors related to the energy transition, which, in turn, will encourage women's

entrepreneurship. This requires a shift from corporation-led programmes to women and community-led small businesses and local partnerships. Early retirement plans may also play an important role for coal workers who will not be able to shift to new forms of employment.

Inclusion of Women and Gendered Factors Within Organisational Strategies

The inclusion of more women in the industry must be done as part of all employment plans, with clear targets for the employment of women. There must also be mechanisms wherein plants are held accountable should they not meet gender targets. In addition, programmes such as the Eskom Women Advancement Programme, launched in 2013, which creates spaces for women to discuss their challenges as women in the industry, are crucial for sharing experiences and espousing solidarity. These programmes should be available to all staff, regardless of permanency or type of contract. In addition, to espouse a more gender-inclusive culture, gender-responsive strategies must be instituted. These include gender-sensitive operational manuals and sex-disaggregated data that produces real-time information about where the gaps are in meeting a gender just transition.

Childcare Support

As discussed in the above sections, women have long subsidised economies by performing unpaid or underpaid care and reproductive labour without compensation. This unpaid work remains high due to underinvestment in essential social institutions such as healthcare, childcare, education, and social protection. A gender just energy transition necessitates the recognition, redistribution, and remuneration of unpaid care work. It should also ensure that women and girls have recognised and rewarded roles in both the reproductive and productive sectors, which includes paid maternity and paternity leave for workers—as both contractors and full-time employees.

Fostering a Safe Work Environment to Learn and Lead

Finally, as part of the qualitative case study with workers in the energy sector, respondents reflected on the factors that helped them succeed in their roles as experts and professionals in the field. Respondents included managers who fostered an environment of trust with consistent and open

communication. Thus, additional training on inclusive management techniques is also necessary for achieving a gender just energy transition.

Conclusion

This research report provides a timely assessment of gender inequality in the South African energy sector, with the aim of shedding light on the barriers and potential pathways for the greater inclusion of women in the just energy transition. Existing just transition plans, such as the Just Transition Framework, acknowledge the importance of addressing gender inequality but fall short of understanding the structural factors that have allowed gendered inequalities to persist. This includes an intersectional analysis of the state of women's labour market participation, the experiences and conditions of work in the energy sector and the distribution of paid and unpaid work in the economy. This report addresses this shortfall by providing new insights derived from three methodologies: a set of interviews with workers in the energy sector, a small-scale household survey and secondary data from the latest quarterly labour force surveys. These three methodologies, which combine both quantitative and qualitative approaches, provide a comprehensive examination of how pre-existing structural inequalities and gender norms intersect to determine women's participation in the South African energy sector.

The gendered labour market trends presented in this report indicate persistent gendered inequalities with men disproportionately represented in both the electricity and coal mining industries and women more likely to be employed in elementary positions, despite higher levels of qualification than their male counterparts. The data also highlight a growing trend towards precariousness in the sector, with increasing numbers of women workers lacking adequate job-based legal and social protections, such as UIF and pension fund benefits, paid sick leave and paid maternity leave benefits in the sector. Against this backdrop, the report assesses the underlying social, structural and institutional factors that have shaped current gendered labour market trends in the energy sector. The report explores potential opportunities and challenges for the equitable inclusion of women as participants and leaders of the just energy transition in South Africa, drawing on a case study of the experiences of workers and households in Komati Village, Mpumalanga.

The analysis provided in this report illustrates the complex nature of women's experiences in the energy sector as shaped by the intersecting inequalities of race, gender, geography, and age. The report highlights the importance of embracing intersectionality in policymaking to achieve a truly gender just energy transition in the South African context. In line with this, the report suggests several recommendations for the equitable inclusion of women in the transition. These recommendations include skills training, adequate access to social protections and social services, ensuring decent work, supporting informal livelihoods, early and frequent communication, fostering a supportive working environment and institutionalising intersectional gendered approaches at organisational and industry levels.

References

Alda-Vidal, C., R. Khalid, C. Foulds, S. Royston, and M. Greene 2023. "Gender Imaginaries in Energy Transitions: How Professionals Construct and Envision Gender Equity in Energy Access in the Global South." *World Development* 168: 106258.

Baker, L., and B. K. Sovacool. 2017. "The Political Economy of Technological Capabilities and Global Production Networks in South Africa's Wind and Solar Photovoltaic (PV) Industries." *Political Geography* 60: 1–12.

Bell, S. E., C. Daggett, and C. Labuski, C. 2020. "Toward Feminist Energy Systems: Why Adding Women and Solar Panels is Not Enough." *Energy Research & Social Science* 68: 101557.

Casale, D., and D. Shepherd. 2020. *The Gendered Effects of the Ongoing Lockdown and School Closures in South Africa: Evidence from NIDS-CRAM Waves 1 and 2*. Department of Economics, University of Stellenbosch.

Collins P. H., and S. Bilge. 2020. *Intersectionality*. 2nd ed. New Jersey: John Wiley & Sons.

COSATU. 2022. "Just Transition: Blueprint for Workers." https://mediadon.co.za/wp-content/uploads/2022/03/Cosatu-JT-Blueprint-Summary-Document.pdf

GIZ. 2022. *Study on Gender Diversity in the Wind and Solar Energy Industries in South Africa*. GIZ.

International Finance Corporation (IFC), World Bank Group. 2022. "Women's Participation in the Renewable Energy Workforce in Sub-Saharan Africa: Identifying Barriers and Opportunities for Women as Leaders and Employees." *World Bank*. URL

International Labour Organization (ILO). 2008. International Standard for the Classification of Occupations. International Labour Office, Geneve Switzerland. URL

Kaijser, A., and A. Kronsell. 2014. "Climate Change Through the Lens of Intersectionality." *Environmental Politics* 23(3): 417–433.

Kenny, B., and A. Bezuidenhout. 1999. "Contracting, Complexity and Control: An Overview of the Changing Nature of Subcontracting in the South African Mining Industry." *Journal of the Southern African Institute of Mining and Metallurgy* 99(4): 185–191.

Lahiri-Dutt, K. 2023. "Framing a Gender Transformative Post-Coal Future for Just Transition: A Feminist Manifesto." *Energy Research & Social Science* 100: 103097.

Lahiri-Dutt, K., S. Dowling, D. Pasaribu, A. R. Chowdhury, H. Do, and R. Talukdar. 2022. "Just Transition for All: A Feminist Approach for the Coal Sector." *World Bank*. Washington, DC, dostupno OVDE. Accessed January 31, 2024.

Mhlana, S. 2023. "Precarious Work and the Gendered Individualisation of Risk in the South African Manufacturing Sector, 2002–2017." *Global Labour Journal* 14(2).

Misra, J., C. V. Curington, and V. M. Green. 2020. "Methods of Intersectional Research." In *Intersectional Experiences and Marginalized Voices*. Routledge. Accessed January 31, 2024.

Nelson, J. A. 2011. "Does Profit-Seeking Rule out Love—Evidence (or Not) from Economics and Law." *WashINGTON University Journal of Law and Policy* 35: 69.

Ogando, A. C., S. Mhlana, and M. Rogan. 2023. "Interrogating Intersectionality: Considerations On Critical Inquiry And Praxis For WIEGO's Actionable Research." *Intersectionality Case Study Report Number 1*. Southern Centre for Inequality Studies, University of the Witwatersrand.

Phillips, J. and S. Petrova, S. 2021. "The Materiality of Precarity: Gender, Race and Energy Infrastructure in Urban South Africa." *Environment and Planning A: Economy and Space* 53(5): 1031–1050.

Presidential Climate Commission (PCC). 2022. "A Framework for a Just Transition in South Africa." *PCC*. URL

Rogan, M., and C. Skinner. 2018. "The Size and Structure of the South African Informal Sector 2008–2014: A Labour-Force Analysis." *The South African Informal Sector: Creating Jobs, Reducing Poverty*: 77–102.

Republic of South Africa. 2022. "South Africa's Just Energy Transition Investment Plan (JET IP) 2023–2027."URL

Simmet, H. R. 2018. "'Lighting a dark continent': Imaginaries of energy transition in Senegal." *Energy Research & Social Science* 40: 71–81.

Statistics South Africa. 2024. "Quarterly Labour Force Survey." *StatsSA*. URL

Wheaton-Greer, M., and J. Wells. 2024. "Black Woman Employee Lifecycle." (infographic) *Greer Consulting*. URL.