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info@tips.org.za
+27 12 433 9340
www.tips.org.za

Author
Muhammed Patel
TIPS Senior
Economist:
Sustainable
Development

NATIONAL EMPLOYMENT VULNERABILITY ASSESSMENT

COAL VALUE CHAIN

September 2025



ABOUT THIS REPORT

The impact of climate change and the decisions taken to reduce emissions will have an impact on workers and communities in multiple value-chains. TIPS, with funding from the UK-PACT Programme has undertaken research on five key value chains that will be impacted: coal, petroleum-based transport, tourism, metals, and agriculture.

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ABBREVIATIONS

BEE	Black Economic Empowerment
CBAM	Carbon Border Adjustment Mechanism
EU	European Union
GDP	Gross Domestic Product
IDC	Industrial Development Corporation
IRP	Integrated Resource Plan
NEVA	National Employment Vulnerability Assessment
RBCT	Richards Bay Coal Terminal
SJRPs	Sector Jobs Resilience Plans
TFR	Transnet Freight Rail
UIF	Unemployment Insurance Fund

1. CONTEXT AND AIMS

This update to the National Employment Vulnerability Assessment (NEVA) for South Africa’s coal value chain incorporates new evidence through 2024/25, combining sectoral trends with a vulnerability lens across mining, transport/logistics, Eskom generation, and Sasol/chemicals, with a geographic focus on the core coal municipalities in Mpumalanga.

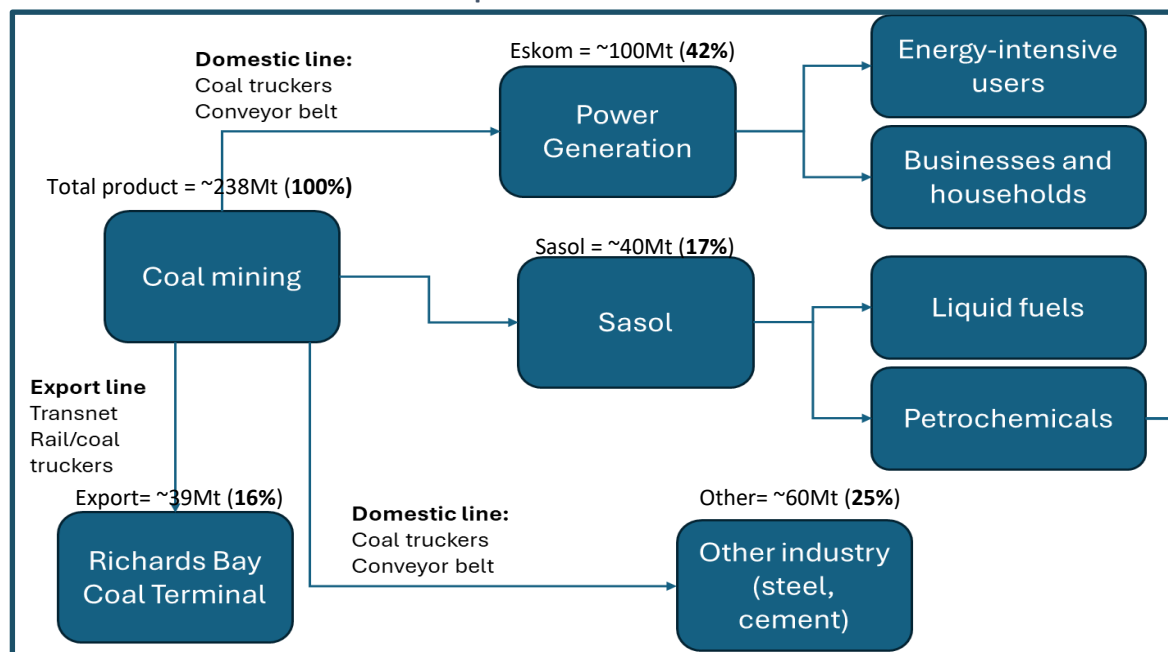
Section 2 of this report outlines the context and scope of the coal value chain, including sales, exports, profitability, employment, and ownership and control. Section 3 examines recent economic trends. Section 4 assesses climate change-related impacts, including demand shifts and policy measures, and synthesises their likely effects and timeframes. Section 5 analyses vulnerabilities in the main coal-dependent municipalities and profiles affected workers, small businesses and communities.

The evidence points to two risk windows for local socio-economic impact: 2030–2036 (Integrated Resource Plan (IRP) retirement of coal capacity and Minimum Emission Standard deadlines) and 2037–2045 (deeper structural decline), with near-term volatility from export logistics, and Indian import dynamics. The purpose of this NEVA is to inform practical, sequenced policy responses (Sector Jobs Resilience Plans (SJRPs)) that protect livelihoods while planning for structural adjustment in coal-dependent places.

2. CONTEXT AND SCOPE OF THE COAL VALUE CHAIN

The coal value chain continues to occupy a central role in South Africa’s development trajectory. It is a crucial source of inputs for electricity and petrochemicals, as well as a major export. In turn, Eskom and Sasol are major exporters as well as providing key inputs for metals refining and downstream chemicals industries. (Graph 1)

Graph 1. The coal value chain



Source: Author, based on Eskom, 2024a; Quantec, 2025b; Sasol, 2025

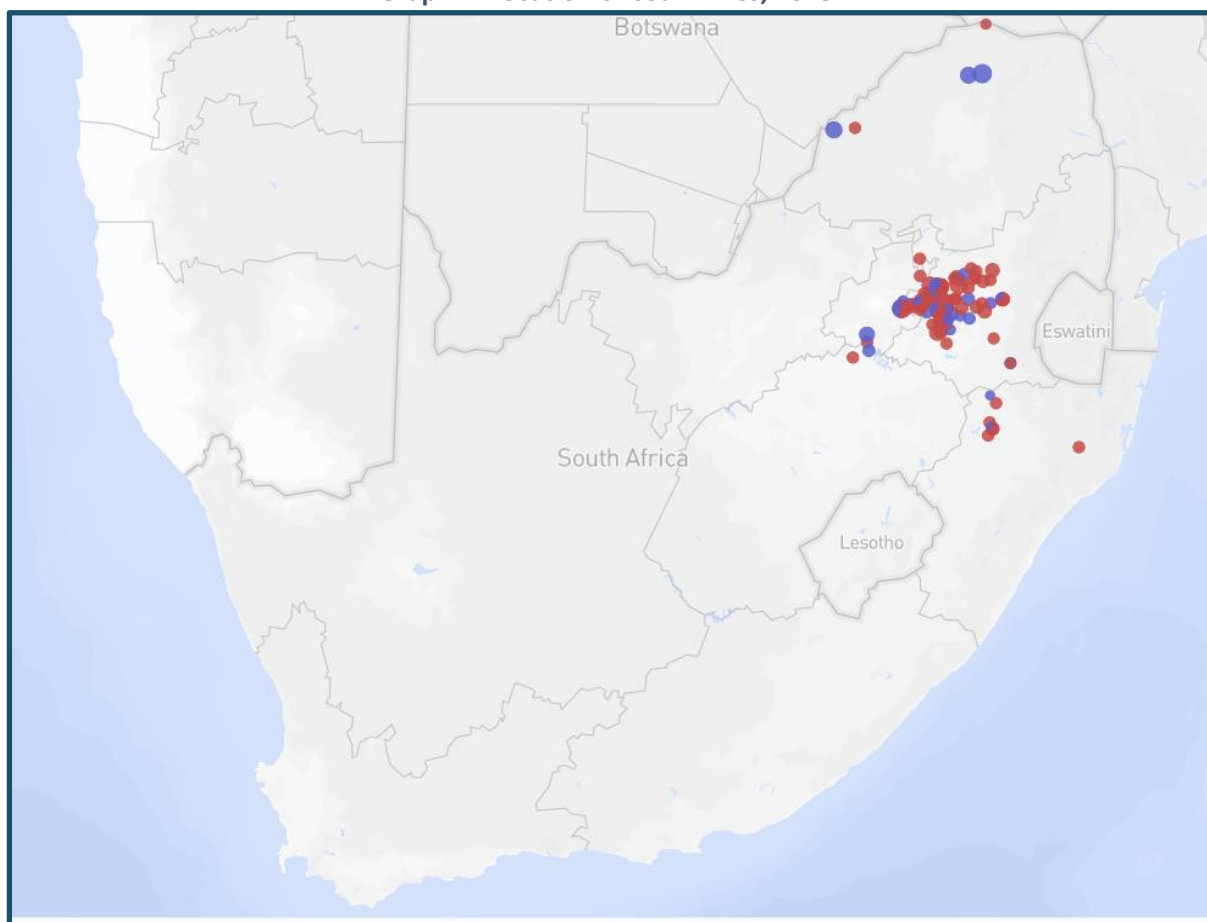
Notes: 1. Customer splits are based on coal volumes. 2. Coal flow volumes were derived by reconciling national coal sales data (Quantec, 2025a), with consumption figures from Eskom and Sasol’s integrated reports. Once Eskom and Sasol’s coal use were accounted for, the balance of ~60 Mt was calculated as the residual of total domestic sales, representing other industrial users.

In 2024, coal mining alone employed nearly 100 000 employees, with about 86% in Mpumalanga (Quantec, 2025b). Considering only employment directly linked to coal-based operations, Eskom had over 12 000 workers and Sasol around 13 000. In terms of taxes, the coal mines contributed close to R4 billion in mineral royalties in 2023/24 (SARS, 2024). Sasol contributed another R4.3 billion in 2024 (Sasol, 2025).

Geographically, coal activities are highly concentrated in Mpumalanga, where four municipalities host the majority of coal mines, Eskom power stations and Sasol facilities. The clustering of economic activity around coal has entrenched wider regional dependence, affecting retail, food services and accommodation in these areas.

The Witbank coalfield is the coal centre of the country's coal production, accounting for about 52% of total saleable coal produced, followed by Highveld (23%), Waterberg (12%) and Sasol-Vereeniging (7%) resources (DMRE, 2023). The Witbank, Highveld, and Ermelo coalfields together account for about 78% percent of the country's total production. (Graph 2)

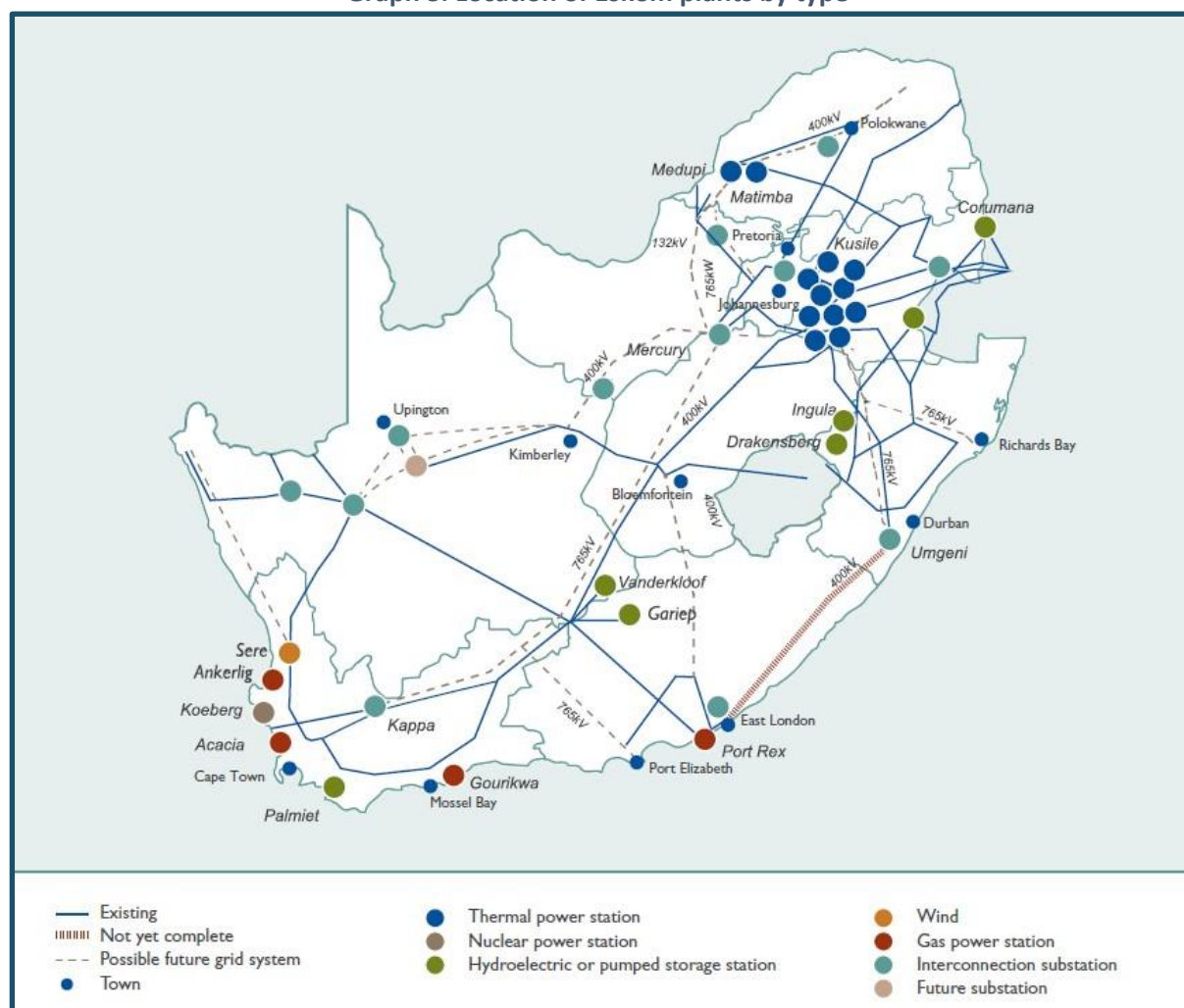
Graph 2. Location of coal mines, 2025



Source: GEM, no date. Note: Red dots indicate current operating mines. Blue dots indicate planned mines.

Most of Eskom's coal-fired plants are located in Mpumalanga with historical proximity to coal resources. (See Graph 3) The newest coal builds, Kusile and Medupi, are located in eMalahleni and Limpopo, respectively.

Graph 3. Location of Eskom plants by type



Source: Eskom, no date. Accessed at <https://www.eskom.co.za/eskom-divisions/gx/>

3. ECONOMIC TRENDS

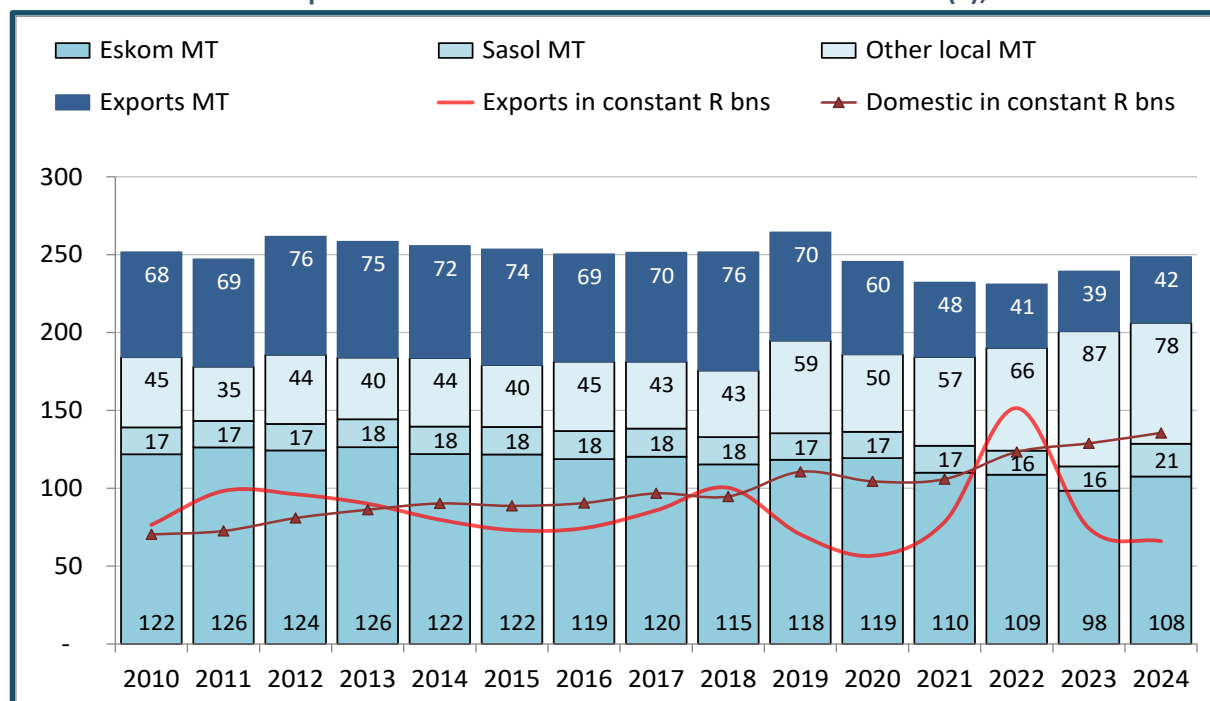
3.1. Sales

As Graph 4 shows, the volume of production of South African coal has fluctuated around 250 million tonnes over the past 15 years. As Eskom's electricity sales declined, however, its share in domestic production fell sharply, dropping from 66% in 2010 to around 50% from 2022 to 2024. The volume of coal exports also shrank by 40% from 2020, mostly because of disruptions to Transnet's bulk coal line from Mpumalanga to the dedicated terminal at Richards Bay. Poor rail service stemmed principally from a combination of corruption in procurement of locomotives, inadequate maintenance, and a surge in the theft of electric cables on the line.

The value of coal sales has been far more volatile than the volume, largely due to the (primarily speculative) fluctuations in the global coal price in 2022 and 2023. While domestic sales have risen fairly consistently in constant Rand terms, export revenues have swung dramatically. In 2024, the domestic unit price per tonne was 70% higher in real terms than it had been 2010. In contrast, international prices have been entirely unpredictable and delinked from production levels since the COVID-19 pandemic and the Russian invasion of Ukraine. In constant Rand terms, the unit price for export coal fell 28% from 2018 to 2020; almost tripled in 2022; then fell back 60% in 2023. As of 2024,

it was still higher than at any point before 2020, and around 50% higher than in 2019. The persistence of relatively high unit export prices in 2024, combined with steady growth in the domestic unit price, meant that total revenues have been stable despite the sharp fall in export volume.

Graph 4. Sales of coal in millions of tonnes locally to Eskom, Sasol and other users and as exports, and value of coal exports and domestic sales in billions of constant rand (a), 2010 to 2024



Source: Calculated from Quantec, 2025b using DMRE Mineral Statistics (coal sales volumes and values), accessed via Quantec EasyData (Quantec, 2025a). Notes: (a) Deflated by CPI.

India accounted for the lion's share of South African coal exports over the past decade. The share generally fluctuated between 40% and 55% of the total. In 2024, it was at 45%.

The decline in coal use at Eskom resulted in a drop in its electricity sales as both its prices rose and its supply became less reliable. From 2008 to 2024, Eskom's average tariff climbed 250% in constant Rand terms (deflated by CPI) while its sales dropped 20%. In response, both businesses and consumers reduced their total electricity use and shifted to other sources, increasingly to off-grid renewable energy in the 2020s. Where these strategies were not available, some electricity-intensive production lines, notably chrome alloy production, simply closed down.

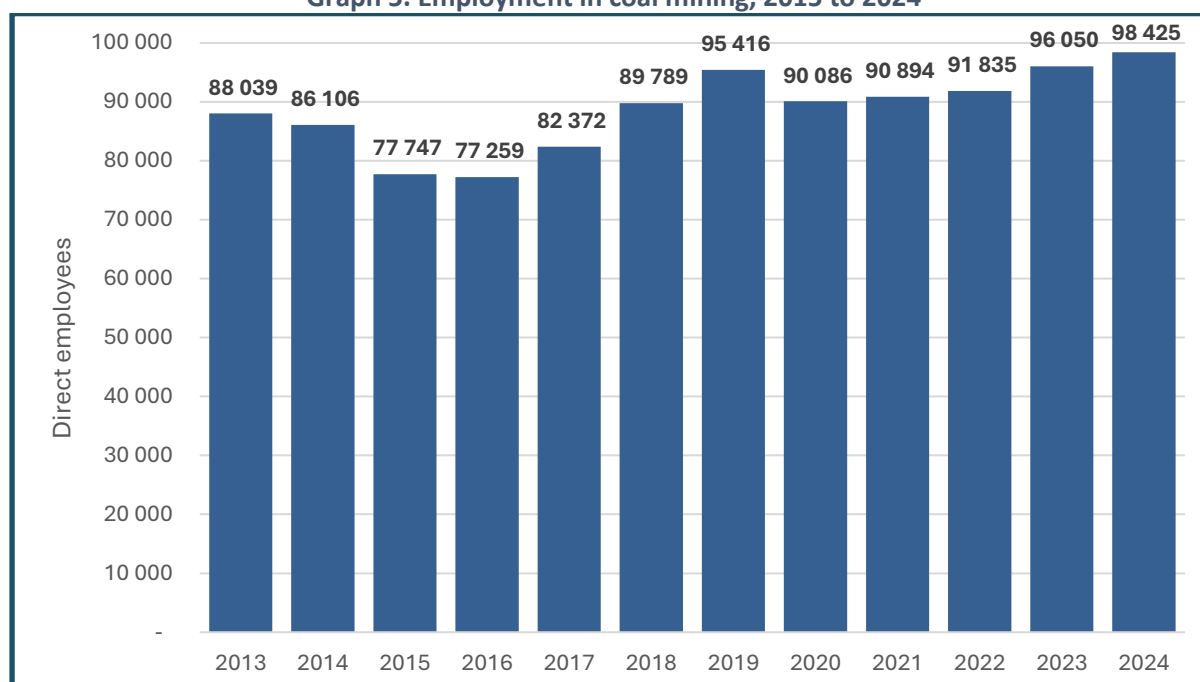
The two main coal users after Eskom, Sasol and the cement production sector (mostly at PPC South Africa) appear to have stabilised coal use over the past 15 years. Both, however, have announced plans to shift to less coal-intensive technologies in the coming decade.

Recent trends at home and abroad do not detract from the likelihood of a significant decline in demand both at home and abroad over the coming 15 years, as discussed in Section 0. High prices currently, however, may make it more difficult for stakeholders to accept and build resilience to the probability of longer-run decline.

3.2. Employment

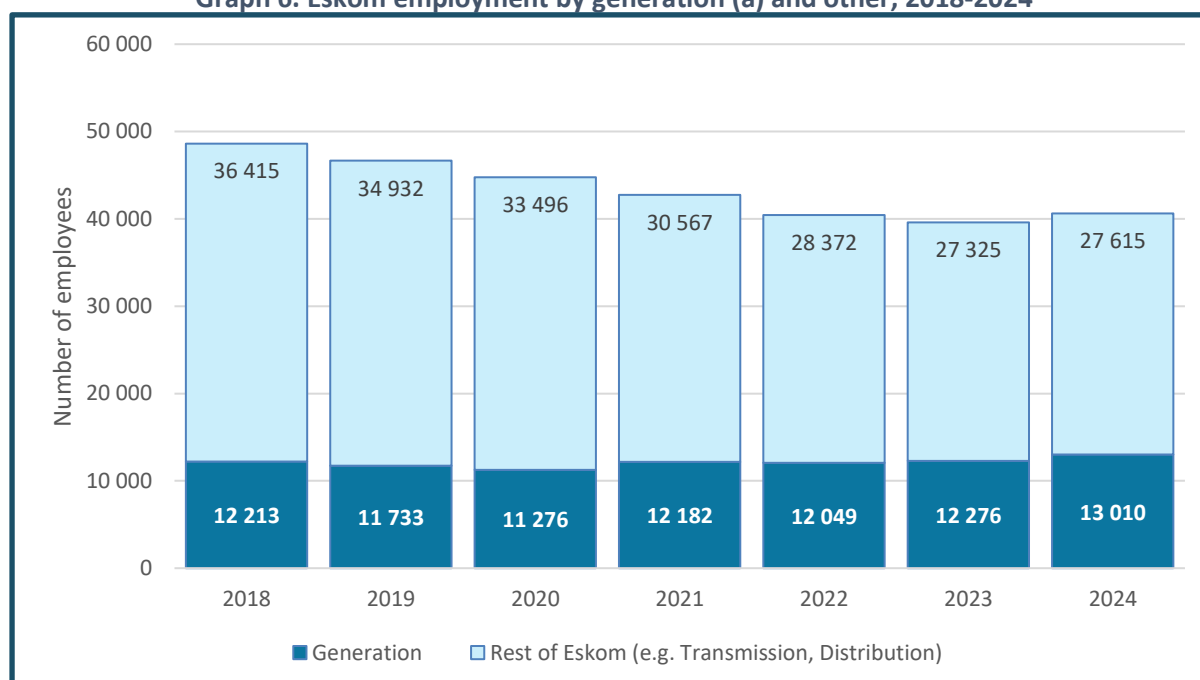
The coal mining sector employed around 98 000 people in 2024, accounting for 20% of all mining jobs.¹

Graph 5. Employment in coal mining, 2015 to 2024



Source: Calculated from MCSA, 2025. Note: Employment covers direct employees, which are permanent mine employees plus site-based contractor personnel reported to the DMRE.

Graph 6. Eskom employment by generation (a) and other, 2018-2024



Source: Eskom Annual Integrated Reports (2018 – 2024). Note: (a) Generation mostly involved work in coal-fuelled plants, although Eskom also has some comparatively small renewable and diesel-fuelled capacity.

¹ Computed based on the average coal employment as a proportion of total mining commodity employment for the period 2020 – 2024. See Quantec, 2025b.

In 2024, Eskom employed about 40 000 workers. The proportion of the workforce linked to coal generation activities can be assessed by examining the generation-linked employees. In 2024, the total number of employees in generation activities was about 13 000 workers. From 2018 to 2023, total employment declined by about 18%, from about 48 000 workers in 2018 to about 39 000 workers in 2023. In 2024, however, it increased again by around 1 000 positions.

In 2024, Sasol employed just over 25 000 employees, with about 13 000 workers directly involved in mining and fuel production. It had about 2 700 employees fewer than in 2018, before the COVID-19 pandemic. The shrinkage, managed mostly through voluntary mechanisms and normal turnover, resulted from a combination of falling demand during the pandemic and an increased focus on streamlining the company and reducing costs.

4. CLIMATE CHANGE-RELATED IMPACTS

4.1 Demand

Despite the strength of coal sales and prices in the past five years, a substantial contraction in both domestic and export sales is expected from 2030. The contraction reflects both the increasing competitiveness of renewable electricity and the impact of policy measures designed to discourage use of fossil fuels.

Domestic demand: The latest draft IRP for energy anticipates the retirement of much of Eskom's coal capacity from 2030 to 2045. As noted, both Sasol and PPC anticipate the replacement of a significant share of their coal-fuelled plant in the coming decade, with impacts likely from the mid-2030s.

Global demand: Coal use is also expected to shrink internationally from 2030, despite important regional divergences. Until 2030, continued growth in demand in India and China will likely offset the accelerating retirement of coal-fuelled plants in advanced economies. By the 2040s, however, virtually all major forecasts see steep reductions in both coal demand and supply – ranging from 30%-50% below 2022 levels in conservative status quo cases, to 80%-90% with ambitious climate action. In particular, China is expected to reach peak coal use from 2030 to 2035, with a subsequent decline. In the rest of the world, various national policy measures combined with changes in the cost of coal relative to renewables are expected to bring about a qualitative shift towards lower carbon sources in the same period.

4.2. Policy measures

Policies that discourage the use of coal have increasingly come into effect in both South Africa and its key trading partners, especially in the Global North.

In South Africa, the Climate Change Act No. 22 of 2024 establishes sectoral emissions targets and company-level carbon budgets, with mitigation plans and reporting duties. As regulations, Carbon Tax Phase 2 and IRP align from 2026, and the scope for coal use will tighten for Eskom, Sasol and most mines.

Internationally, the implementation of Carbon Border Adjustment Mechanism (CBAM) by the European Union (EU) from 2026 and the United Kingdom from 2027 will effectively raise tariffs on coal-intensive exports. While CBAM does not target coal directly, it is expected to affect demand for downstream products that rely on Eskom's coal-fuelled power, which include ferro alloys, steel and paper. The measures will be phased in over time, however, giving exporters time to introduce cleaner energy sources where possible.

In addition to national and regional tax measures, development finance institutions – including the Industrial Development Corporation (IDC) and the World Bank Group – have generally begun to avoid new high-emissions projects, including most coal-based operations. They have provided substantial funding to expand renewable energy, including in South Africa. Virtually every major renewable energy project in South Africa has some IDC support.

The business response to measures designed to discourage the use of coal have taken three main forms: the shift to alternative inputs for electricity and petrochemicals; reduced investment in coal-based production; and divestment of South African coal mines to smaller local companies.

As noted in the previous section, a growing share of electricity in South Africa has been sourced from renewables. While this shift mostly resulted from an effort to go off-grid, some companies have also sought to decarbonise their products to avoid CBAM and carbon taxes. Sasol has also been trying to identify alternative feedstocks for its liquid fuels and petrochemicals operations, starting with gas and more recently exploring green hydrogen. In contrast to Eskom, its coal use for liquid fuels has been fairly stable over the past 15 years. If Sasol cannot transition to alternative inputs in the coming decade or so, it may end up downsizing substantially (see Crompton et al., 2024)..

Falling interest in coal emerged from relatively slow growth in investment from the late 2010s. According to Quantec estimates, growth in fixed capital in coal grew far more slowly than in the rest of mining from 2019 to 2024. Mining outside of coal saw growth of 6% in its fixed capital in this period; in coal, fixed capital expanded by only 0.7%. The rest of the economy expanded its fixed capital by 1.3%.

As coal-based production is seen as the worse prospect for lenders and investors, the companies in the value chain have typically had to pay more for capital with shorter payback periods on loans and increased refinancing risks. In response, some companies have turned to Asian financial sources, but given the economic fundamentals that is unlikely to reduce costs substantially in the longer run.

In addition, international mining companies have largely distanced themselves from existing mining operations. Fifteen years ago, virtually all of South Africa’s major coal mines belonged to global mining companies and Anglo American; in 2024, only Glencore remained.

In 2021, both Anglo American and South32 divested their substantial coal holdings in South Africa. Anglo American sold six export-grade mines to Thungela Resources, as well as its 23% share in the Richard Bay Coal Terminal. South32 sold its South Africa Energy Coal subsidiary, which held four mines that supplied Eskom, plus its share in the coal terminal to Seriti (South32, 2021).

In 2024 the top five major coal mining producers in South Africa were Exxaro (20%), Seriti Coal (17%), Sasol Mining (13%), Thungela Resources (9%) and Glencore (6%). Together, they accounted for about 65% of South Africa’s total saleable coal production in 2022. Smaller, “junior” coal producers supply the rest.

As a result of these divestments, Black Economic Empowerment (BEE) companies and junior producers now comprise about 80% of the coal market by volume (DMRE, 2024). In effect, the divestment process has shifted the risk of climate-related downsizing onto smaller, more locally owned companies.

Table 1 provides a summary of the likely impacts considered in this section, the elements of the value chain that stand to be impacted, their likely probability, and a provisional view on the expected timeframe.

Table 1. Potential impacts affecting the coal value chain

Risk	Impact on value chain	Probability	Timeframe
CBAM	High impact: Coal mining, Sasol, Eskom Transnet Freight Rail (TFR), Richards Bay Coal (RBCT), coal transporters	High (EU legislated; others likely)	Mostly medium term as phased in from late 2020s
Accelerated decarbonisation in key import markets and through IRP and emissions targets	High impact: Coal mining and associated logistics; Eskom; Eskom	High	Medium to long term (5–15 years)
Reduced international and domestic financing for coal-based projects	Higher cost of capital, shorter repayment periods, and insurance constraints for coal mining, Eskom, Sasol, small businesses, RBCT/TFR.	Medium (already underway for many lenders but remains partial)	Short to medium term (1–8 years)
Carbon tax escalation	High impact: Eskom, Sasol, coal mining	High (legislated increases post-2026)	Short to medium term (2–7 years)

Source: Author. Note: Some measures have already been instituted. For example, the EU CBAM comes into full effect in 2026.

4.2. Effects on the value chain

Downstream coal refineries can mitigate the impact of measures to reduce emissions at least partially by changing to alternative feedstocks (renewables, green hydrogen, gas) or developing new product lines. That said, it seems likely that at least some job losses will be experienced among the approximately 25 000 workers who work most directly in coal refining at Eskom and Sasol. Sasol appears more vulnerable because of the technical difficulties involved in moving away from coal.

The biggest challenge arises for the coal miners and their communities, as the mines have little scope for redirecting their core business. Starting in the 2030s, they are likely to see some downsizing, reversing the modest improvement in their fortunes from 2020 to 2025.

5. VULNERABILITY IN THE COAL VALUE CHAIN

Various approaches have emerged to analyse individual, group and community vulnerability in the face of crises, including climate change. Most of these research agendas centre on the effects of natural disasters. In contrast, the analysis in this report aims, in most cases, to understand the capacity of various groups to adjust to economic changes that result from longer-term, often fairly gradual developments.

A review of various studies in South Africa (see Gbetibouo and Ringler, 2009; Fraser et al., 2011) suggested that the key issues are access to financial resources; physical capital, which for most working class South Africans consists almost exclusively of housing; human capital, including competencies and qualifications and ability to work; and social capital as reflected in family and local networks and participation in relevant organisations. In addition to individual and household resources, community resources depend both on access to funds and the nature and capacity of institutions (See Fraser et al. 2011:3; Gbetibouo and Ringler 2009:10-11).

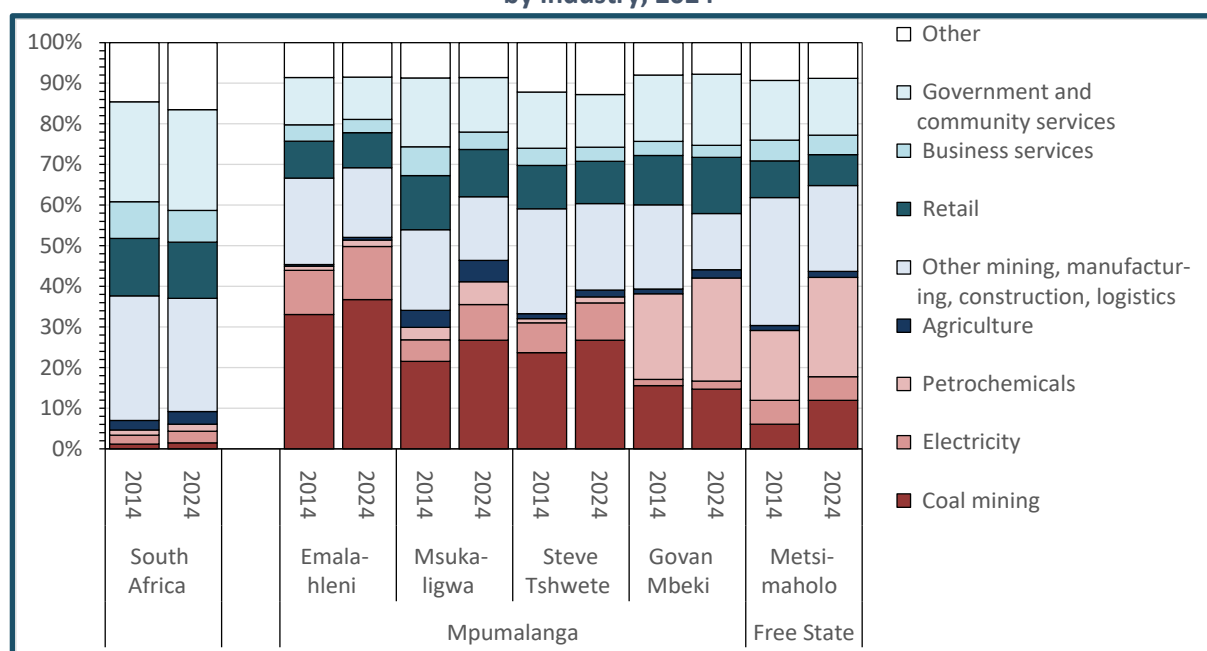
In South Africa, control over all of these kinds of resource aligns largely not only with class but also with race and gender. Differences in resourcing by race and gender are indicated where relevant. In the coal value chain, however, the most vulnerable groups – production workers outside of supervisory and management roles and working-class communities in coal-dependent municipalities – include almost no white people. The mining value chain also employs relatively few women.

This section first outlines the economic structure and relative prosperity of the municipalities that depend on the coal value chain. It then reviews the resources available to workers in the mining value chain and these communities.

5.1. The economics of the affected municipalities

As identified in the previous NEVA documentation, four municipalities in Mpumalanga have an extraordinarily high orientation towards coal mining and refining. They are eMalahleni (Witbank), Steve Tshwete (Middelburg), Govan Mbeki and Msukaligwa (Ermelo). Metsimahola, formerly Sasolburg, is also analysed because of the growing pressure on Sasol. As Graph 7 shows, the share of the coal mining value chain, including electricity and coal-based petrochemicals, ranged from 37% to 51% in 2024. The share of coal mining had increased compared to a decade ago, mostly because of higher coal prices rather than growth in output. For comparison, in South Africa as a whole the coal value chain accounted for well under 10% of gross domestic product (GDP).

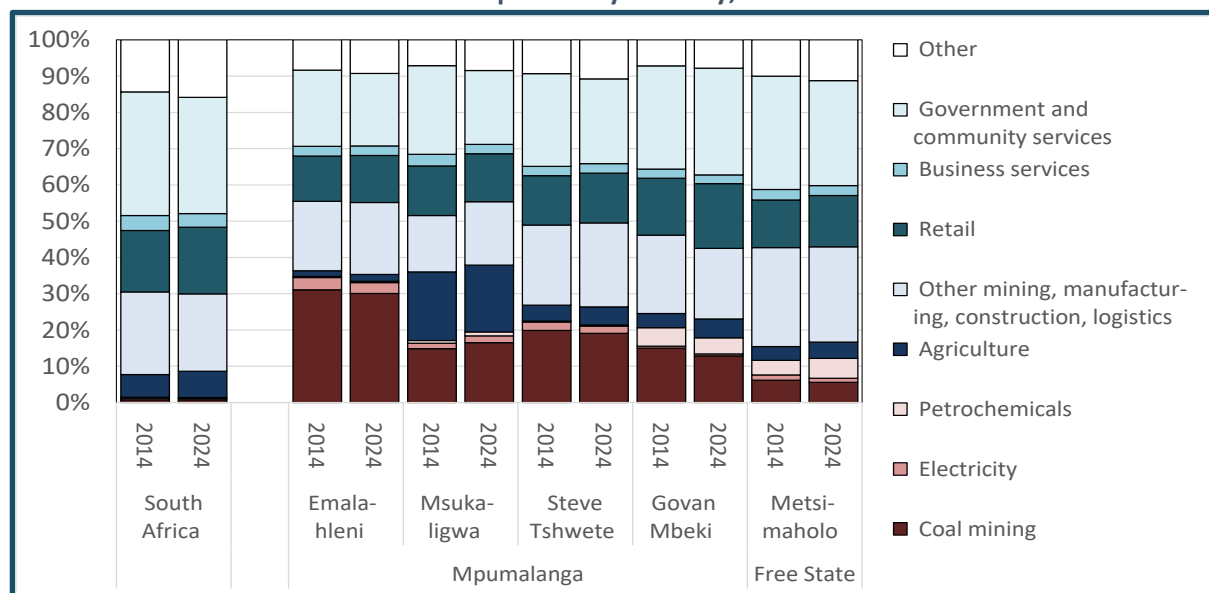
Graph 7. Gross Value Added in South Africa and in the coal-dependent municipalities by industry, 2024



Source: Calculated from Quantec. EasyData. Interactive dataset. Series on regional gross value added. Downloaded from www.quantec.co.za in September 2025.

Formal employment in the coal-dependent municipalities was also characterised by an unusual dependence on coal mining. In contrast, because Eskom and Sasol were comparatively capital intensive, they generated relatively few jobs, despite their substantial contribution to gross value added in these towns. (Graph 8) By extension, the long-run downsizing in coal mining will lead to significant job losses for the municipalities unless they are able to develop alternative economic opportunities on a significant scale.

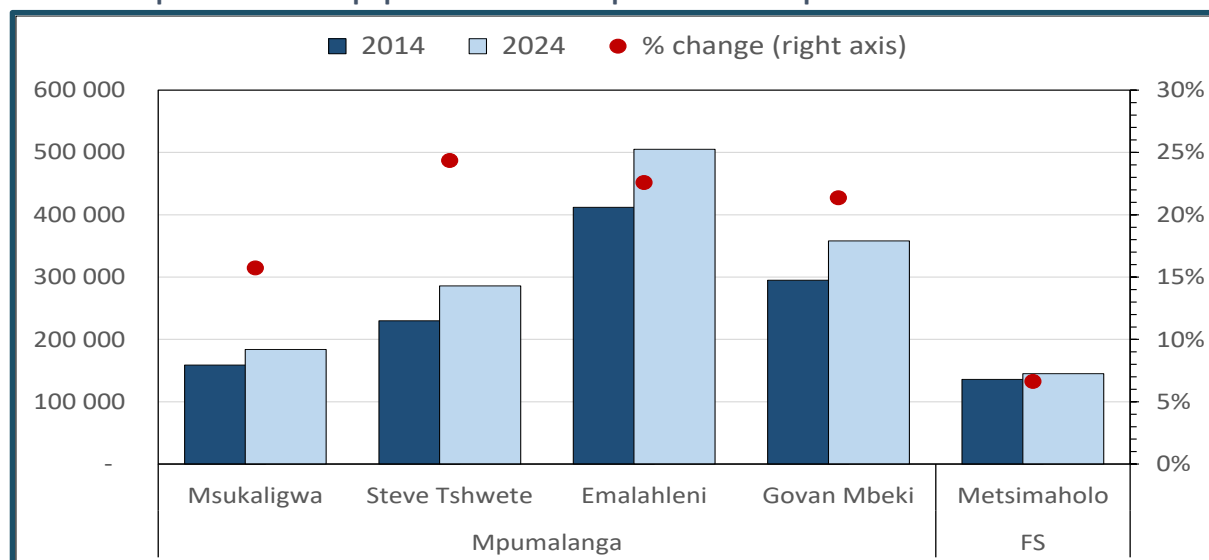
Graph 8. Formal employment in South Africa and in the coal-dependent municipalities by industry, 2024



Source: Calculated from Quantec. EasyData. Interactive dataset. Series on regional gross value added. Downloaded from www.quantec.co.za in September 2025.

The population of the coal-dependent municipalities varied between 150 000 in Msukaligwa and Metsimaholo and 500 000 in Emalahleni. Over the past decade, all except Metsimaholo expanded substantially faster than the national population, which grew 14% in this period.

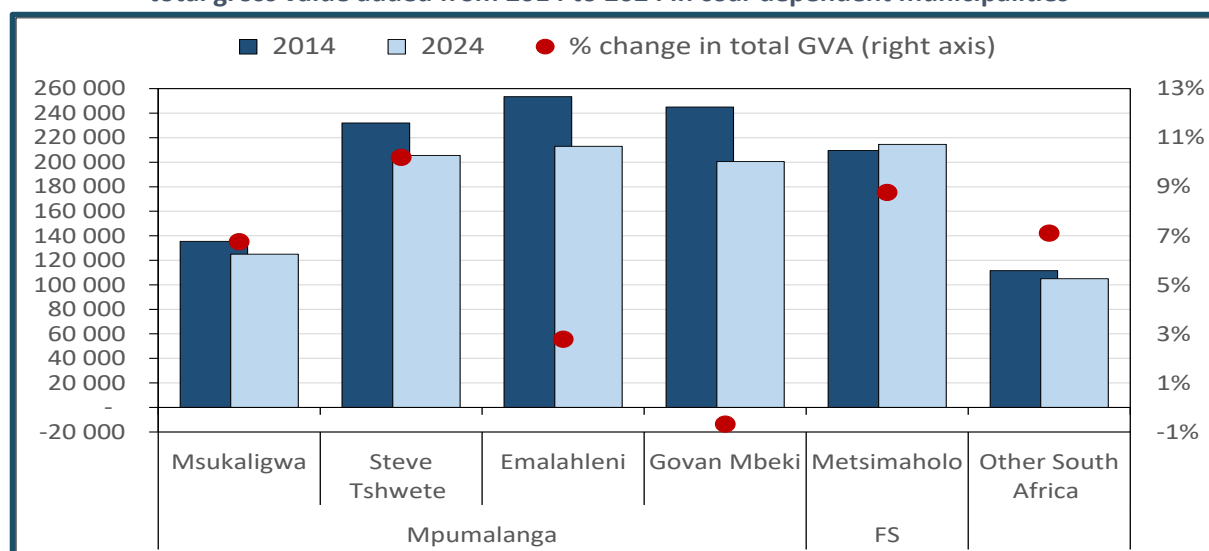
Graph 9. Estimated population in coal-dependent municipalities in 2014 and 2024



Source: Estimates by Quantec. EasyData. Interactive dataset. Series on regional demography. Accessed at www.quantec.co.za in September 2025.

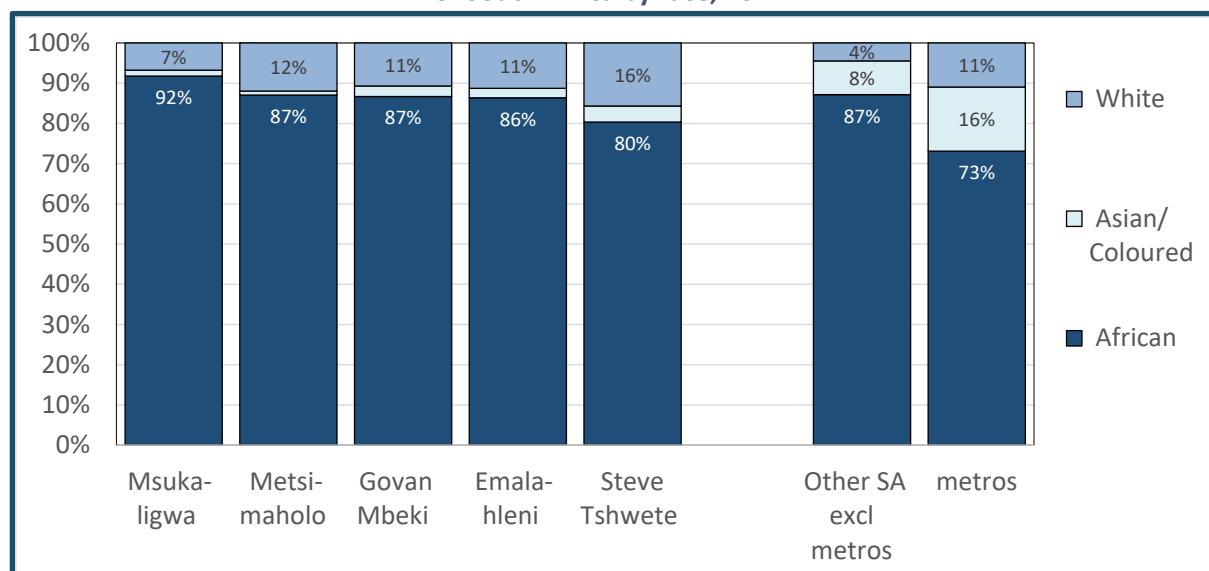
Gross value added per person in the coal-dependent municipalities was significantly higher than the national average. In line with national trends, however, it was lower than a decade ago in every case. Still, except in Msukaligwa, it was almost twice as high as the average in the rest of the country. The relatively high level of gross value added per person reflected the status of these towns as secondary cities around the Vaal Triangle, the historic centre of economic activity in South Africa. Still, in three municipalities – Msukaligwa, Emalahleni and Govan Mbeki – overall growth over the decade was slower than rest of the country. In Govan Mbeki, the economy shrank from 2014 to 2024. (Graph 10)

Graph 10. Gross value added per person in constant (2024) rand (a), and percentage growth in total gross value added from 2014 to 2024 in coal-dependent municipalities



Note: Reflated with GDP deflator rebased to 2024. Source: Estimates by Quantec. EasyData. Interactive dataset. Series on regional production and population. Accessed at www.quantec.co.za in September 2025.

Graph 11. Population in the coal-dependent municipalities, metros and the rest of South Africa by race, 2024



Source: Calculated from Quantec. EasyData. Interactive dataset. Series on regional demography. Accessed at www.quantec.co.za in September 2025.

Africans were somewhat over-represented in the population of the coal-dependent municipalities, reflecting their geographic position. (Graph 11) The historic neglect of investment in government

services for Africans means that they were less likely to have household services, education and healthcare. While the backlog has been overcome to some extent, it remains significant. That affects the resources available in working-class communities in the coal-dependent towns, as discussed below.

Overall, the coal-dependent municipalities start from a relatively strong base in value added per person. That reflects their position in the historic industrial centre of the country around the Vaal Triangle. Their role in the economy was, however, shaped by coal, which leaves them vulnerable to the probable structural transition to new energy sources over the coming decades. From this standpoint, a core challenge for SJRP for the coal value chain is to build on the undoubted strengths historically developed in these regions. Those strengths in industrial and business capacity, expertise, civil society and worker skills, should enable them to move onto a new growth path that offers opportunities for the workers and businesses that will face disruption as coal downsizes.

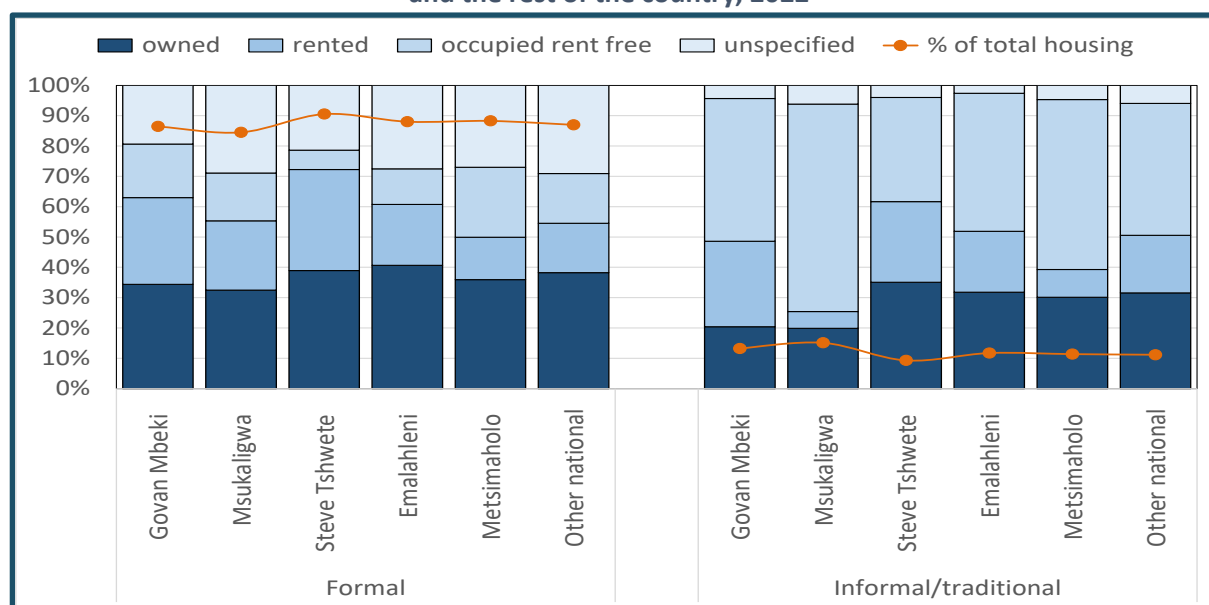
5.2. Dimensions of vulnerability

In the coal-dependent communities, the main groups vulnerable to the long-run transition away from coal were miners and small businesses that supply the coal value chain or its employees. This section evaluates the extent to which these groups had access to physical, financial, human and social capital. Since data on small businesses in the individual municipalities are not available, information on communities as a whole is used as a proxy where it is relevant.

5.2.1. Physical capital

Vulnerable groups' physical capital takes two main forms: the resources of small businesses, such as retail sites, workshops or farm land, and equipment; and family housing. There is no available data on the resources available to small businesses at municipal level. The Census, however, provides information on housing. As Graph 12 shows, levels of ownership of formal housing in the coal-dependent municipalities was virtually the same as in the rest of the country. That said, most non-African households did not respond to the question at all.

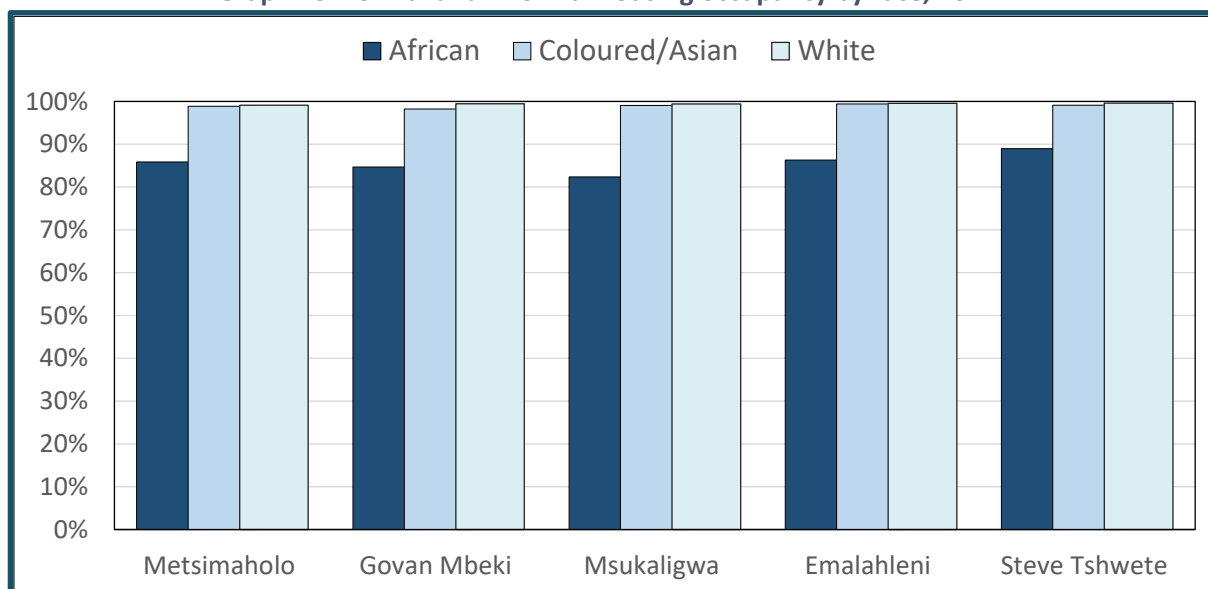
Graph 12. Tenure status of formal and informal housing in coal-dependent municipalities and the rest of the country, 2022



Source: Calculated from Statistics South Africa. Census 2022 municipal profiles. Accessed at SuperWeb facility at Statistics South Africa in September 2025.

Despite the relatively high level of home ownership, the value of housing in most working-class communities was under R500 000. Moreover, there was virtually no market for housing in these areas, which meant they could not easily be used as collateral for formal loans. The Census does not provide information on the value of homes by race. As Graph 13 shows, virtually no non-Africans lived in informal housing, underscoring the extent to which class and race still largely align.

Graph 13. Formal and informal housing occupancy by race, 2022

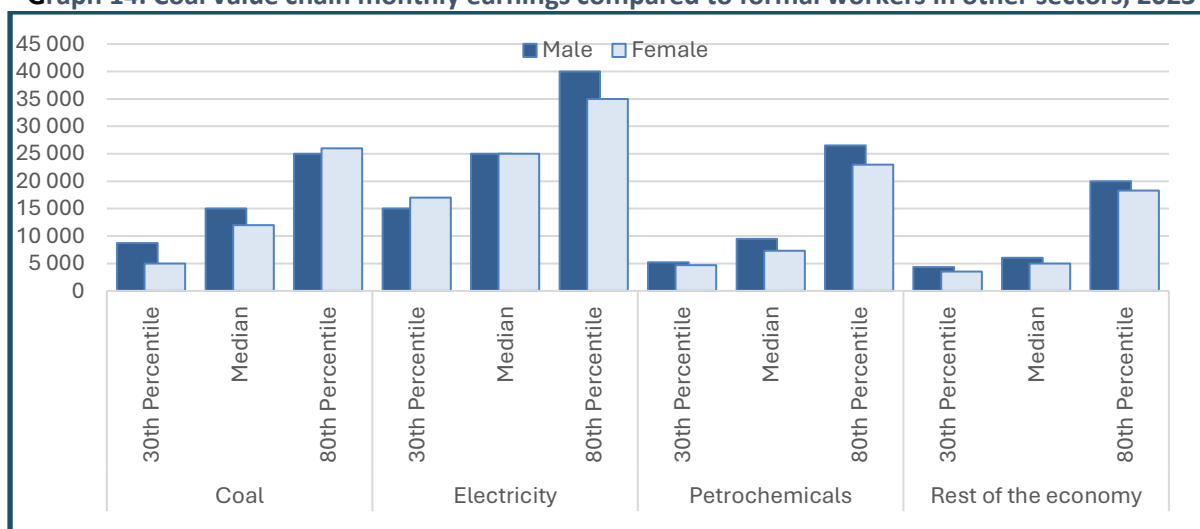


Source: Calculated from Statistics South Africa. Census 2022 municipal profiles. Accessed at SuperWeb facility at Statistics South Africa in September 2025.

5.2.2. Financial capital

In terms of financial resources, workers in the coal value chain typically compare well with other formal workers, especially in light of relatively low levels of formal qualifications. In 2023, as Graph 14 shows, median pay along the coal value chain was substantially higher than in most of the rest of the formal economy. In coal mining, the median pay was in excess of R10 000 a month, compared to about R6 000 for other formal workers in the economy.

Graph 14. Coal value chain monthly earnings compared to formal workers in other sectors, 2023

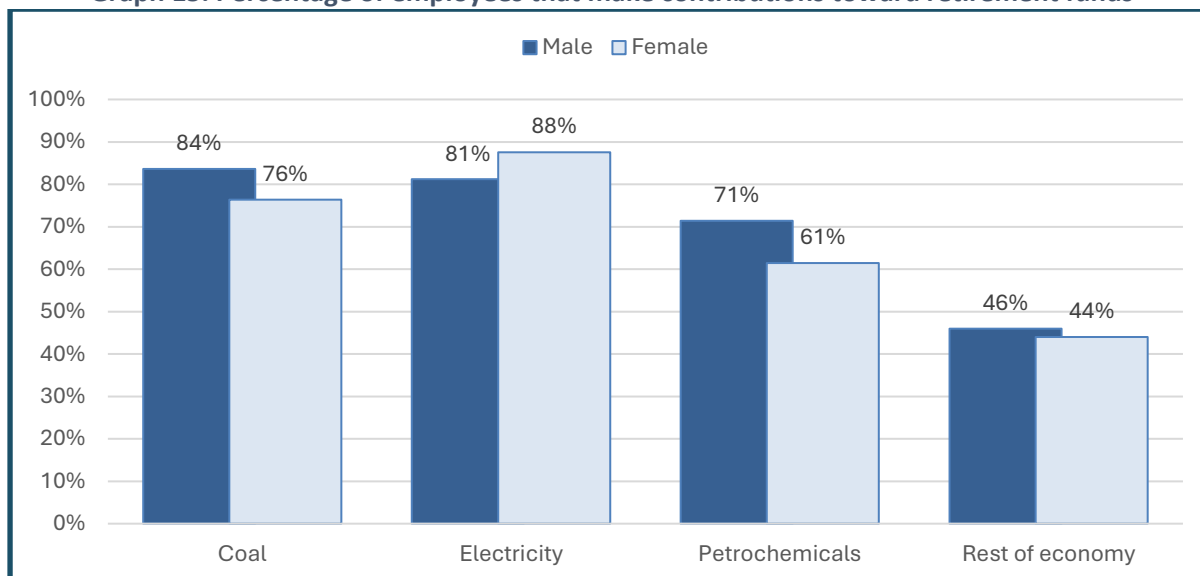


Source: Calculated from Statistics South Africa. Labour Market Dynamics 2023. Electronic dataset. Downloaded from Stats SA. See Stats SA, 2023.

The median wage in coal for men exceeded women by about R3 000 a month. Only around 20% of all workers in the coal value chain are women, however, compared to around 45% in the economy as a whole. In the electricity industry, median pay was closer to R25 000 a month, with minimal difference between men and women. In petroleum and basic chemicals, the median wage exceeded R5 000 a month, with men earning about R2 000 a month more than women.

Over 60% of workers in the coal value chain had retirement funds in 2023, with the figure rising above 80% for mining and electricity. That compared to less than 50% of other formal workers in the rest of the economy. As with pay, conditions for women in the coal value chain tended to be worse in this regard than for men.

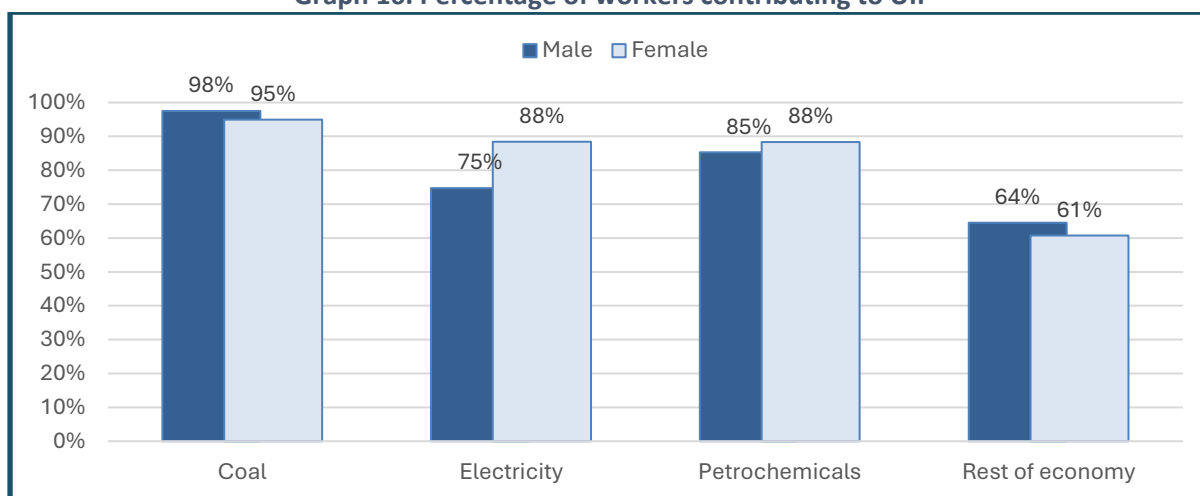
Graph 15. Percentage of employees that make contributions toward retirement funds



Source: Calculated from Statistics South Africa. Labour Market Dynamics 2023. Electronic dataset.
Downloaded from Stats SA. See Stats SA, 2023.

Unemployment Insurance Fund (UIF) contributions provide insights into the financial resilience of workers. More than 75% of the coal value chain workers report UIF contributions, across genders. This compares to just under 65% of workers in the rest of the formal economy.

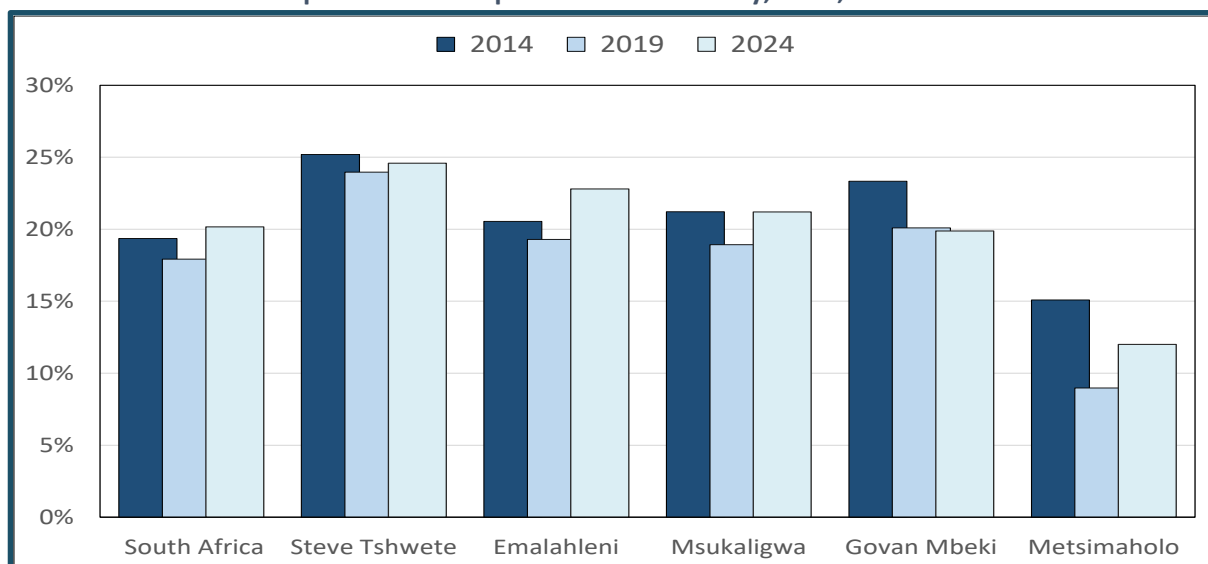
Graph 16. Percentage of workers contributing to UIF



Source: Calculated from Statistics South Africa. Labour Market Dynamics 2023. Electronic dataset.
Downloaded from Stats SA. See Stats SA, 2023.

From a community standpoint, the picture was less rosy. According to Quantec estimates, all of the coal-dependent municipalities in Mpumalanga had higher poverty rates than the national norm, using the international poverty line of US\$1.90 a day. The high levels of poverty despite high value added, indicated the deep inequalities often found in mining communities. (Graph 17)

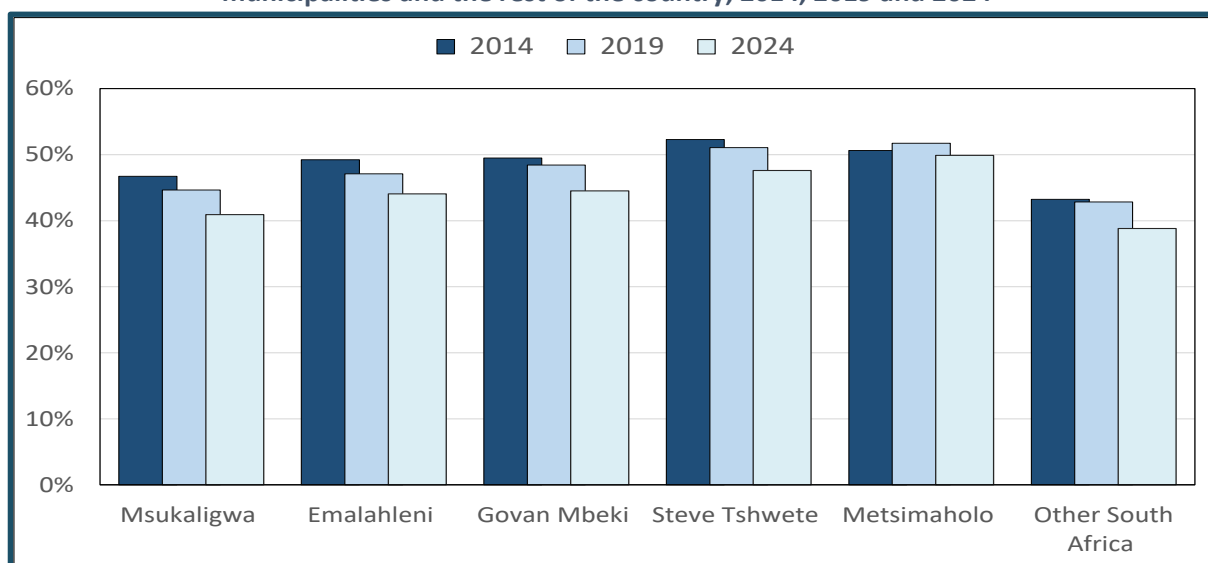
Graph 17. Share of the population living below the international poverty line in coal-dependent municipalities and nationally, 2014, 2019 and 2024



Source: Quantec. EasyData. Interactive dataset. Series on regional development. Accessed at www.quantec.co.za in September 2025.

While poverty rates were estimated to be high in the coal-dependent towns, employment levels were also above the national norm. In 2024, a higher share of the working-age population was employed in all of these municipalities than in the rest of the country. That said, as was true across the country, the share had fallen since 2014, in part because of a broad economic slowdown from 2015, and in part because of the lingering effects of the pandemic downturn. (Graph 18)

Graph 18. Share of working aged people with employment in the coal-dependent municipalities and the rest of the country, 2014, 2019 and 2024

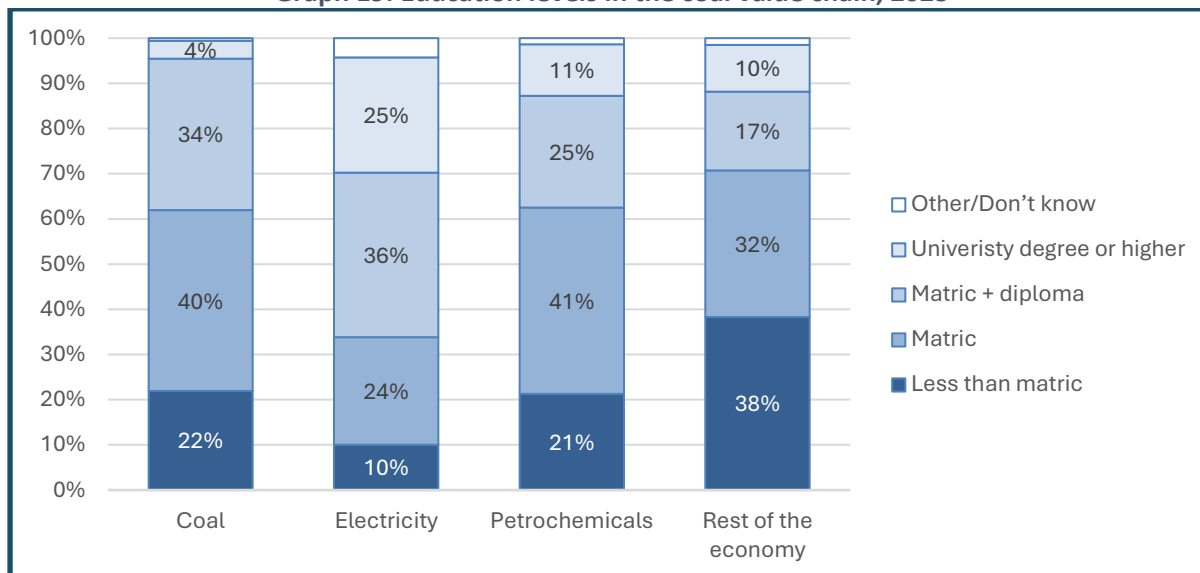


Source: Quantec. EasyData. Interactive dataset. Series on regional development. Accessed at www.quantec.co.za in September 2025.

5.2.3. Human capital

Workers in the coal value chain were more likely to have matric or a degree than in the rest of the economy. As a result, the earnings-education dynamic noted in the previous NEVA persists: coal mining workers receive about 2.5 times the salary of the rest of the formal economy for largely a broadly similar education profile. By extension, if coal production downsizes, less qualified workers in the value chain will struggle to find jobs with similar levels of pay.

Graph 19. Education levels in the coal value chain, 2023

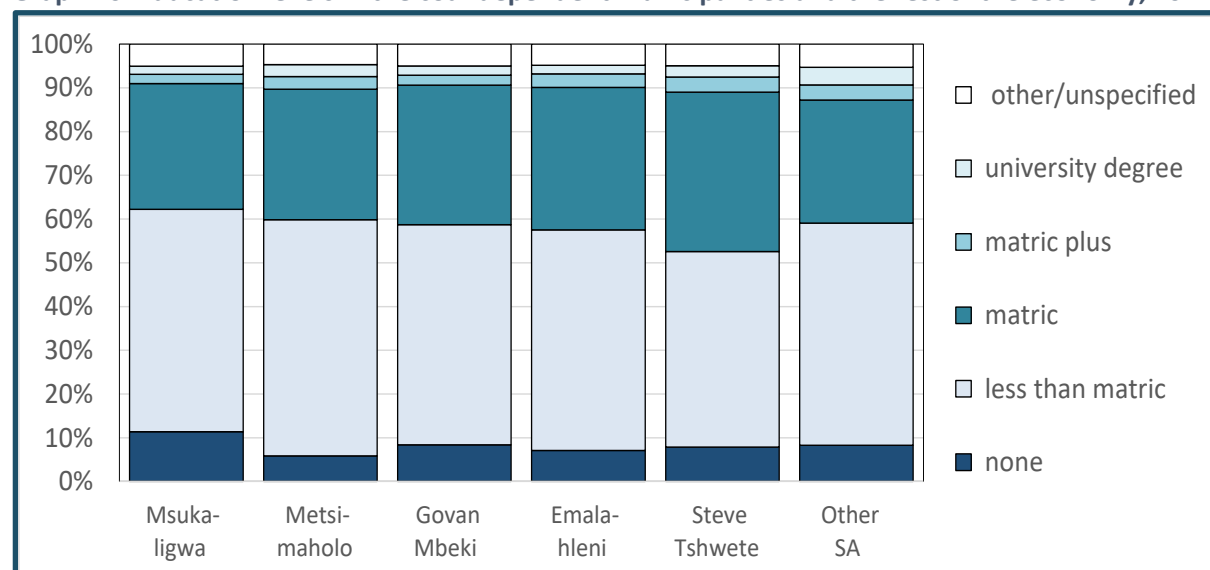


Source: Calculated from Statistics South Africa. Labour Market Dynamics 2023. Electronic dataset.

Downloaded from Stats SA. See Stats SA, 2023.

The coal-dependent municipalities were more or less in line with levels of matric in the rest of the country, with the exception of Msukaligwa. They generally had substantially fewer residents with post-secondary qualifications, however. In part, this reflected the comparatively limited scale of professional businesses services and finance in these towns.

Graph 20. Education levels in the coal-dependent municipalities and the rest of the economy, 2022



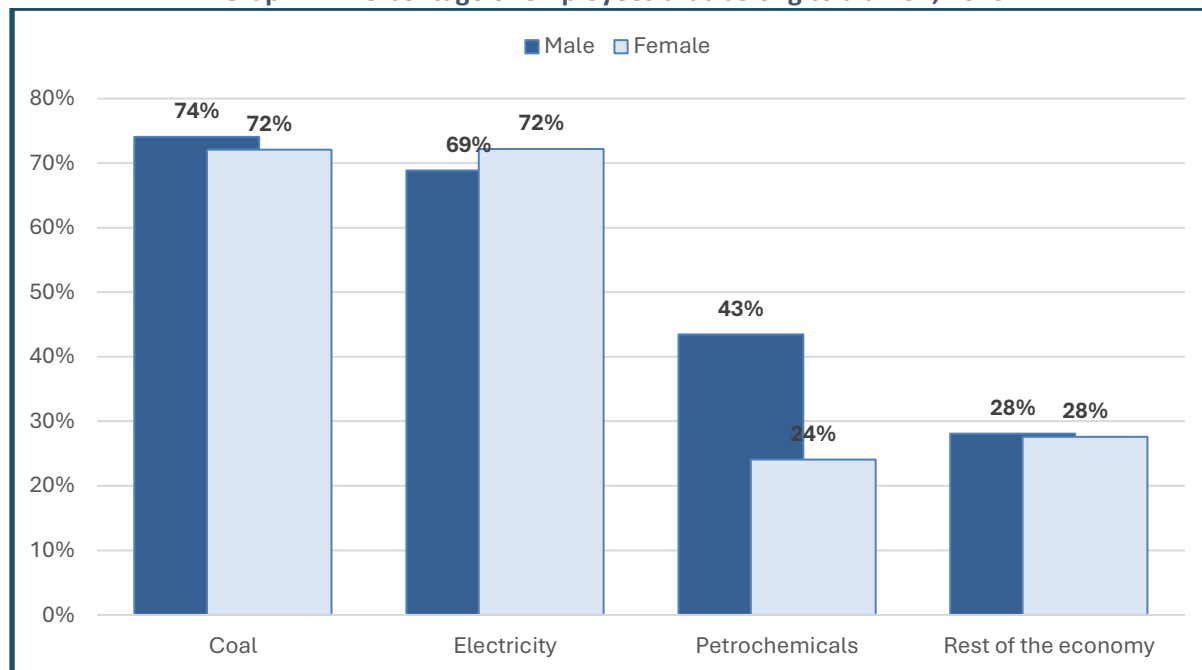
Source: Calculated from Statistics South Africa. Census 2022 municipal profiles. Accessed at SuperWeb facility at Statistics South Africa in September 2025.

5.2.4. Social capital

Social capital for vulnerable groups in the coal value chain is measured in this report in two ways: the organisation of workers in the value chain itself, and the capacity of their municipalities.

Workers in the coal value chain, as in heavy industry in general, have a high level of union membership compared to other formal workers. Mining is particularly well organised. Over 70% of miners are union members, which is more than twice the average for the formal economy. The share falls to 70% in electricity, and to 43% for men and 24% for women in petrochemicals.

Graph 21. Percentage of employees that belong to a union, 2023

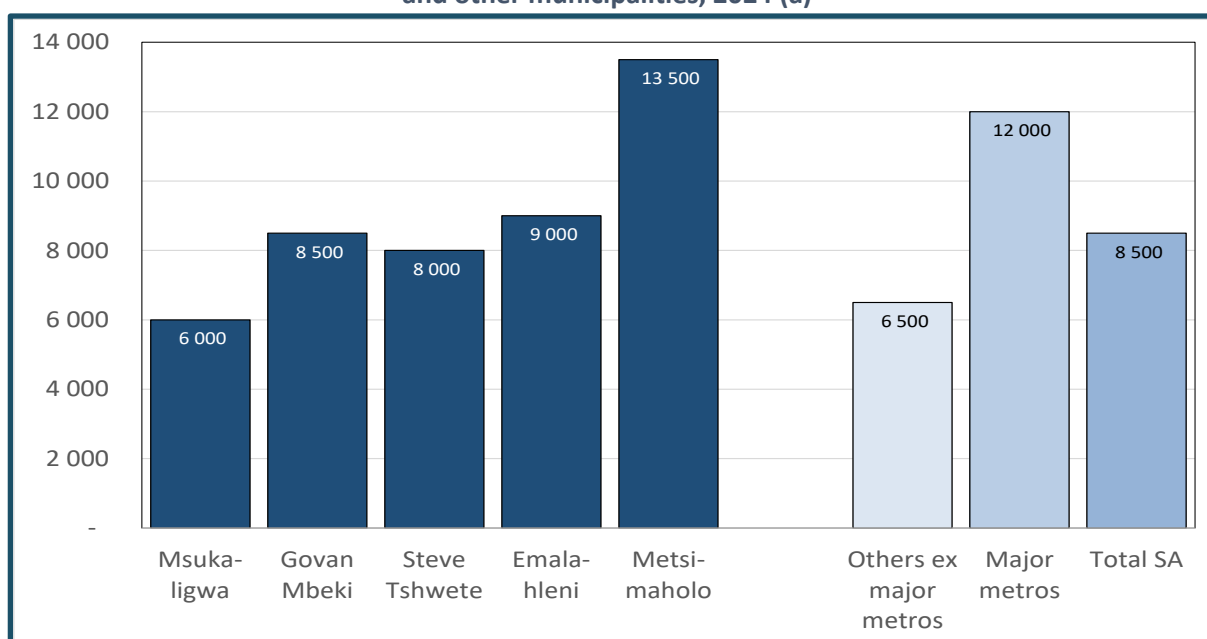


Source: Calculated from Statistics South Africa. Labour Market Dynamics 2023. Electronic dataset.
Downloaded from Stats SA. See (Stats SA, 2023)

As might be expected given their very high union membership, workers in the coal value chain were more likely than other formal employees to have permanent positions, negotiate wage increases, and get the rights to paid leave set under the Basic Conditions of Employment Act No. 75 of 1997.

The relative prosperity of the coal-dependent municipalities meant that they enjoyed significant resources, which could help prepare vulnerable workers to deal with the gradual transition away from coal. As Graph 22 shows, only Msukaligwa had municipal income per person below the national average. All of the other coal-dependent towns were significantly above the norm outside of the metros. In Metsimaholo, municipal income per person exceeded that of the large metros.

Graph 22. Municipal income per person in coal-dependent municipalities and other municipalities, 2024 (a)

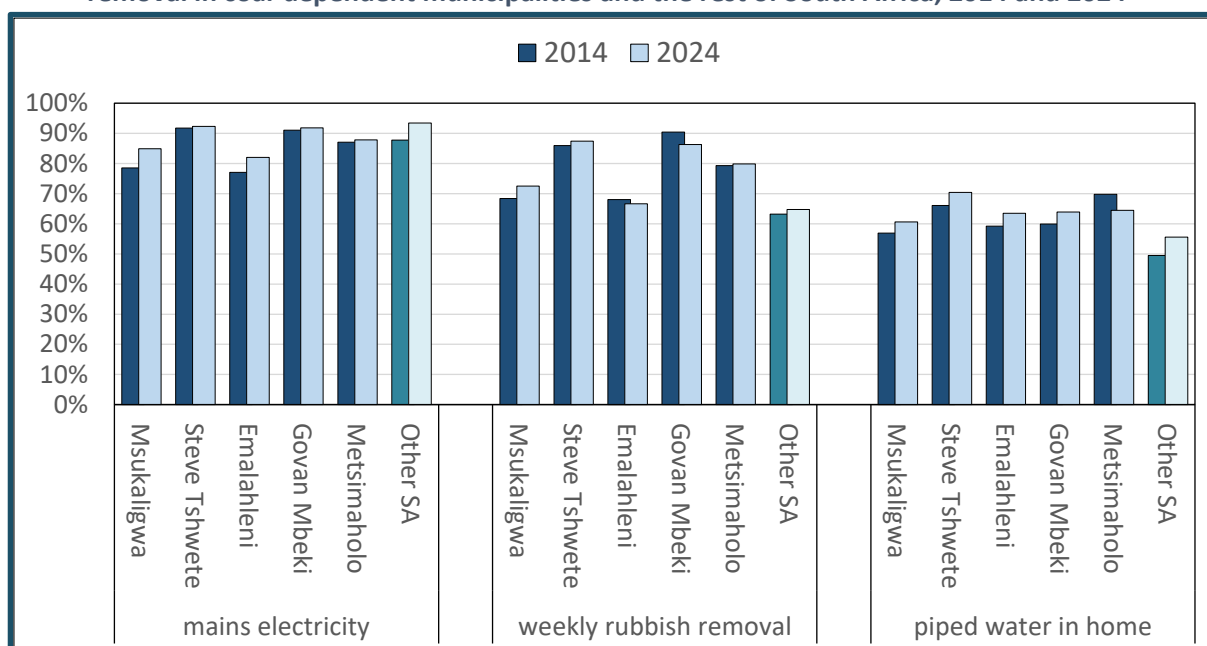


Source: Calculated from National Treasury. Municipal Finance Data. Electronic dataset on income and expenditure (v2). Downloaded from <https://municipaldata.treasury.gov.za/> in September 2025.

Note: (a) Excludes grants and transfers. Major metros include the Gauteng metros, Cape Town and eThekweni.

The relative prosperity of the coal-dependent municipalities was reflected in comparatively strong household infrastructure. In 2024, a higher share of households than in the rest of the country had piped water at home and weekly rubbish removal. The level of access to mains electricity was around the same as in the rest of the country.

Graph 23. Share of houses with mains electricity, piped water at home and weekly rubbish removal in coal-dependent municipalities and the rest of South Africa, 2014 and 2024



Source: Estimates by Quantec. EasyData. Interactive dataset. Series on regional development.

Accessed at www.quantec.co.za in September 2025.

6. CONCLUSION

This vulnerability analysis provides some context for the development of a Sector Jobs Resilience Plan for the coal value chain in the second phase of this project. To that end, it identifies the impacts of the climate crisis on the value chain, with some sense of their timeframes. In that context, it points to the extent to which working people and their communities will be vulnerable as the basis for developing more targeted and effective responses.

As the earlier analysis indicated, the impact of the climate crisis on the coal value chain will take place principally as the consequence of policies and shifts in consumer demand that aim to reduce greenhouse gas emissions. That means the process will likely be gradual, with the effects felt mostly after 2030. While Eskom can find new feedstock, Sasol faces greater technical difficulties. The mines seem likely to ultimately downsize, although the timing depends in large part on the pace at which climate-friendly policies are implemented especially in South Africa itself, in Europe and in India.

The geographic concentration of the coal value chain in parts of Mpumalanga and in Metsimaholo means that vulnerability has to be understood in terms of the impact on coal-dependent communities, not just the immediate job losses for workers. Both workers and communities need to start now to build a basis for the transition over the coming decade. Both start with significant financial resources and capital, but comparatively limited skills. Moreover, deep inequalities in the communities mean that, despite comparatively strong local economies (with the partial exception of Msukaligwa), poverty is already high by national standards.

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