# Economic Resilience Through Renewable Energy

## Paper 1 includes:

**Policy Brief**

**Published Academic Paper**

**ECSECC Report**

**ECSECC Knowledge Engagement Seminar (26 June 2025)**

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# INTRODUCTION

This study employs the Economy-wide Social Accounting Matrix **SAM-Based Leontief Multiplier Model** to assess the adverse effects of load shedding on key macroeconomic variables in the Eastern Cape. Furthermore, the study uses **Micro-Simulation Techniques** to examine the impact of a R29.9 billion investment through the Independent Power Producers Procurement Programme (IPPPP) in renewable energy, financed by increased government subsidies for energy-efficient technologies. This investment constitutes 6.9% of the provincial GDP and 21.9% of the total provincial budget (National Treasury, 2022).

The aim of the study is to determine whether this substantial injection into renewable energy projects presents a transformative opportunity **to mitigate the negative effects of load shedding** and promote economic resilience. Findings seek to provide **the net effect** by comparing the adverse impact of load shedding with the positive economic outcomes generated by the R29.9 billion investment in renewable energy projects.

# Problem statement


The Eastern Cape is experiencing severe economic challenges, including low growth, high unemployment, widespread poverty, and deepening inequality. These issues are further compounded by prolonged drought conditions, an ongoing recession, and stringent fiscal austerity measures. The persistent energy crisis, marked by frequent load shedding, is exacerbating these structural weaknesses, placing additional strain on an already fragile economy and labour market.

The adverse effects of load shedding are particularly evident in energy-intensive sectors, where businesses face operational disruptions, increased costs, job losses, and growing employment insecurity. Recent data from Statistics South Africa (Stats SA, 2024) reveal that the provincial GDP has contracted for three consecutive quarters (-0.3% in Q3 2023, -0.1% in Q4 2023, and -0.3% in Q1 2024), signalling a prolonged recession. Furthermore, employment in Q1 2024 declined by 0.3%, while the unemployment rate surged to 42.2%—the highest in the country. These figures highlight the critical need for urgent policy interventions to address the economic and social ramifications of the ongoing energy crisis

# Research questions

The study seeks to address the following four key questions

1. What are the determinants and major future trends of the electricity sector, including productivity, investment, and comparative advantages?
2. How does the current energy crisis hinder the province from achieving its macroeconomic objectives of growth, employment, and poverty alleviation?
3. What is the effect of a R1 billion expansionary fiscal policy, with government investment in the electricity sector, on the Eastern Cape economy and labor market?
4. What is the impact of a R21.9 billion IPPPP investment on job creation across different demographics and sectors? Additionally, what is the net effect of the adverse impacts of load shedding compared to the positive economic outcomes generated by this renewable energy investment?

# Research Objectives

The study aims to achieve the following four objectives

1. To conduct a comprehensive economic analysis of the energy sector, forecasting key determinants of electricity production and distribution and their implications for load shedding.
2. To assess the effects of load shedding on selected macroeconomic variables, including GDP, labor, and total production output.
3. To simulate the impact of increased government spending in the energy sector on the Eastern Cape's macroeconomic objectives of growth, employment, and poverty reduction.
4. To evaluate the economy-wide impact of a R21.9 billion IPPPP investment in renewable energy in the Eastern Cape and to determine the net effect of the negative consequences of load shedding against the economic benefits generated by this investment.

# RESEARCH METHODOLOGY

Research design

Calibration

Model

Simulations

# Structure of the Eastern Cape Macro-SAM

**Expenditure – Columns**

**Income – Rows**

| | Activities C1 | Commodities C2 | Factors C3 | Households C4 | Government C5 | Savings and Investment C6 | Rest of World C7 | T |
|---|---|---|---|---|---|---|---|---|
| **Activities R1** | | Domestic supply | | | | | | Activi incor |
| **Commodities R2** | Intermediate demand | | | Consumptio n spending (C) | Recurrent spending (G) | Investment demand (I) | Export earnings (E) | Total dema |
| **Factors R3** | Gross Value-Added | | | | | | | Total incor |
| **Households R4** | | | Factor payments to households | | Social transfers | Foreign remittances | | Total hous incor |
| **Government R5** | | Sales taxes & import tariffs | | Direct taxes | | Foreign grants and loans | | Gove incor |
| **Savings and Investment R6** | | | Private savings | | Fiscal surplus | | Current account balance | Total savin |
| **Rest of World R7** | Import payments (M) | | | | | | | Forei exch outfl |
| **Total** | Gross output | Total supply | Total factor spending | Total household spending | Government expenditure | Total investment spending | Foreign exchange inflow | |

7×7 matrix comprising:  43 Activities, 43 Commodities, 5 Factors, 14 Household-levels, Government, Savings and Investment, and the Rest of the World

# Definition and Micro-Simulation Data

**Load shedding** is the deliberate and controlled reduction of electricity supply to specific areas or consumers by power utilities to prevent the total collapse of the electrical grid. It occurs when electricity demand exceeds supply, often due to insufficient generation capacity, infrastructure failures, or fuel shortages.

**Statistics South Africa (Stats SA) publishes reports and data on load shedding** (Stats SA, 2022), providing sectoral insights into output losses and employment reductions across industries. This data was used to simulate the impact of load shedding on the Eastern Cape economy.

**Independent Power Producers Procurement Programme (IPPPP)**
The Department of Mineral Resources and Energy (DMRE) launched the Independent Power Producers Procurement Programme (IPPPP) in 2010 as an urgent government intervention to enhance South Africa's power generation capacity (DMRE, 2010). The programme's primary mandate is to procure electrical energy from the private sector, leveraging both renewable and non-renewable energy sources.

The government has allocated R29.9 billion in subsidies to support energy-efficient technologies. The study investigate the impact of this investment on the Eastern Cape economy

# Inter-industry linkages of the renewable energy sector

The SAM model is a quantitative economic technique that captures the interdependencies among different sectors of the economy. Broadly, there are two types of SAM-based multiplier models: the demand driven & the supply driven models:

**The demand-driven model developed Leontief**

$$BL_j^c = \sum_{i=1}^{n} \frac{x_{ij}}{x_j} = \sum_{i=1}^{n} a_{ij}$$

**Backward linkages:** the renewable energy sector (comprising solar, wind, and other clean energy technologies) stimulates demand for intermediate goods and services from other industries. In essence, this indicates how much the renewable energy sector relies on inputs from other sectors such as manufacturing (Sánchez ,1998)

**The supply-driven model proposed by Ghosh**

$$FL_i^c = \sum_{j=1}^{n} \frac{x_{ij}}{x_i} = \sum_{j=1}^{n} a_{ij}$$

**Forward linkages**, conversely, reflect the extent to which the renewable energy sector supplies inputs to other industries, thereby influencing their production processes. This is especially relevant for sectors such as manufacturing, transport, and public utilities, which benefit from cleaner and more stable electricity sources (Duarte et al. ,2002)

# Key error metrics applied, and techniques used to balance the SAM

Since the SAM involves highly interconnected data structures (sectoral outputs, household income, factor payments, etc.), small imbalances or estimation errors can propagate across the model. Applying appropriate error metrics allows for the detection of inconsistencies, biases, or systemic inaccuracies in the construction and balancing of the model (Miller, R.E., & Blair, P.D., 1985). Two error metrics were used:

**The mean absolute difference** (MAD) is used to measure overall accuracy in economic and economy-wide Leontief models, providing an idea of the average size of the errors without considering their direction (Miller & Blair, 1985).

$$MAD = \frac{1}{n} \sum_{i=1}^{n} |O_i - M_i|$$

**The standardized total percent error** (STPE**)** expressed as a percentage of the observed values, adjusted for scale, it helps compare the relative accuracy of models with different scales or units, especially in regional economic modeling. (Jackson & Murray, 2004)

$$STPE = \frac{\sum |O_i - M_i|}{\sum O_i} x\ 100$$

To <u>**update**</u> the SAM, we used **RAS techniques**, one of the most widely used techniques for updating a matrix while preserving known row and column totals (Stone, 1961). To <u>**balance**</u> the SAM, we used the **Cross-Entropy (CE) method** (Robinson et al., 2001; Golan, Judge & Miller, 1996)

# Research design and models

To achieve its objectives, this study employs three models:

**1.Eastern Cape macro-econometric model**

Forecasts key economic indicators and determinants of electricity production and distribution. Findings guide policy decisions, investments, and infrastructure planning to ensure long-term energy security.

**2. Social Accounting Matrix (SAM) Leontief Multiplier Model**

Two economy-wide simulations were done, assessing the impact of (1) load shedding and (2) expansionary fiscal policy on economic growth, labor, and production. Output, GDP, and GVA multipliers inform industrial, trade, and investment policies.

**3. Microsimulation techniques** (SAM's external matrices)

Four economy-wide simulations were done, evaluating the impact of a R21.9 billion IPPPP investment in renewable energy (1) on economic growth and (2) on the provincial labour market. Additionally, (3) Tax multipliers and (4) investment multipliers were done to provide insights for fiscal policies and public-private partnerships

Four Micro-Simulations for Employment multipliers were done to inform the impact of the investment on labour policy, in terms of (1) Gender (2) Youth (3) Rural development, and (4) Skills.

# Selected key findings

This section presents key findings corresponding to each research objective

# Objective 1:Trend analysis and forecasts of the energy sector

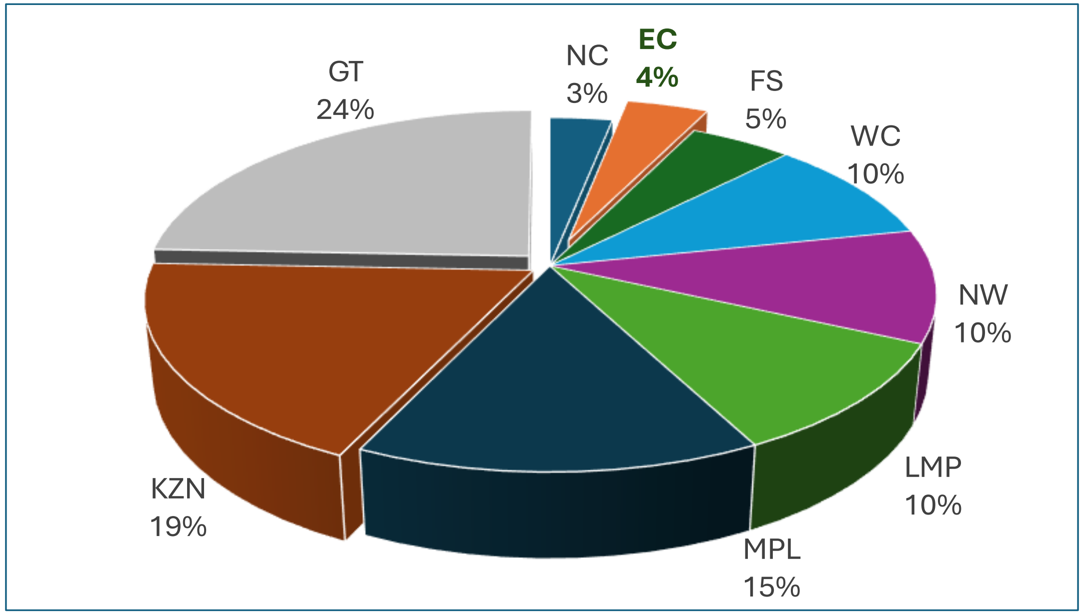
- ***Low contribution to national grid***: The Eastern Cape province contributes only 4% to the national electricity grid, compared to Gauteng (24%), KwaZulu-Natal (19%), and Mpumalanga (15%). This highlights the region's minimal role in national energy production, necessitating strategic interventions to enhance its energy sector significance.
- ***Declining location quotient***: The location quotient of the Eastern Cape energy sector has declined over time, indicating a loss of comparative advantage and decreasing sector significance. Policymakers need to address the underlying factors contributing to this decline to restore the sector's competitiveness.
- ***Decrease in electricity generation***: Total electricity generated and available for distribution in the Eastern Cape declined by 9% from 9,191 GWh in 2016 to 8,358 GWh in 2023. There is an urgent need for measures to reverse this downward trend and boost electricity production capacity.

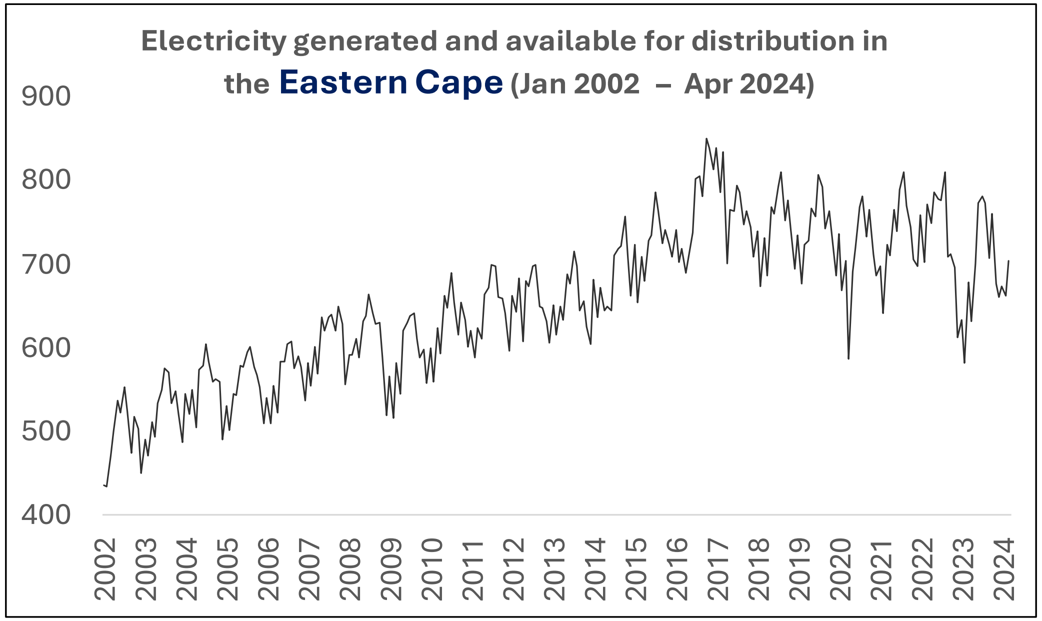
# Objective 1: Trend analysis and forecasts of the energy sector

- ***Increased input costs***: The cost of producing electricity (Intermediate Consumption Expenditure - ICE) has increased, while all other indicators (output, CoE, GVA, GoS) have declined. The implication is that rising costs amidst declining output indicate inefficiencies that need to be addressed to ensure economic viability and sustainability of the sector.
- ***Overall productivity decline***: The energy sector's productivity has been declining from 1993 to 2025. Strategic initiatives are required to enhance productivity and ensure sustainable sector growth. Looking at productivity individually, capital productivity peaked around 2007 and has since declined, indicating that capital investments are not translating into proportional output increases. It is crucial to optimize capital investments to enhance their productivity impact. However, labor productivity has steadily increased from 1993 to 2025.
- ***Increased CoE in informal sector***: Compensation of Employees (CoE) in the informal energy sector has increased from R50 million in 1995 to R83 million in 2025. While informal sector growth is positive, integrating these gains into the formal economy could further enhance overall economic benefits.
- ***Underinvestment in machinery***: Investment in machinery and other equipment has sharply declined, suggesting underinvestment in technological upgrades. Significant investments in modern machinery and technology are essential for improving production efficiency.

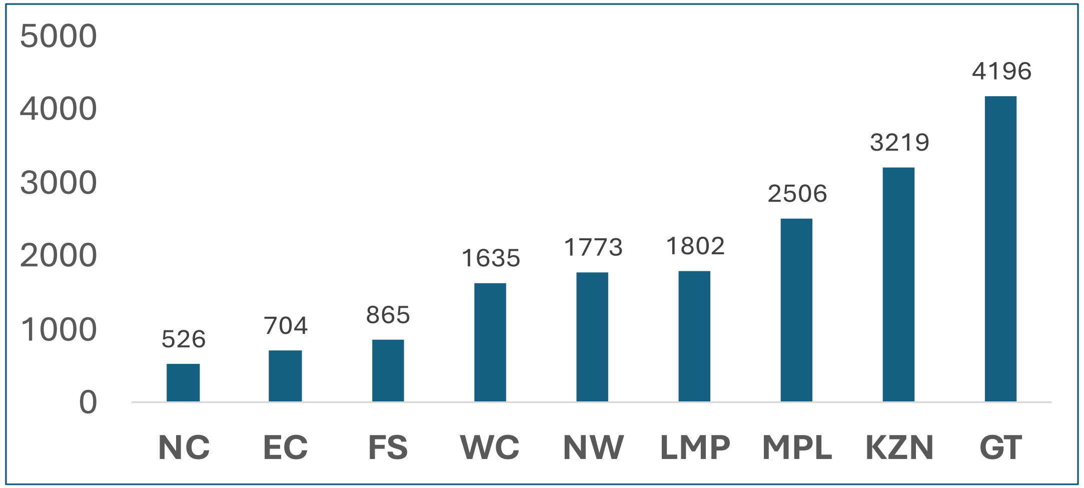
# Electricity generated and available for distribution in South Africa(Gigawatt-Hours)

*The Eastern Cape (4%) remains one of the lower contributors to the national electricity grid*




Electricity generated and available for distribution in South Africa (Gigawatt -Hours)

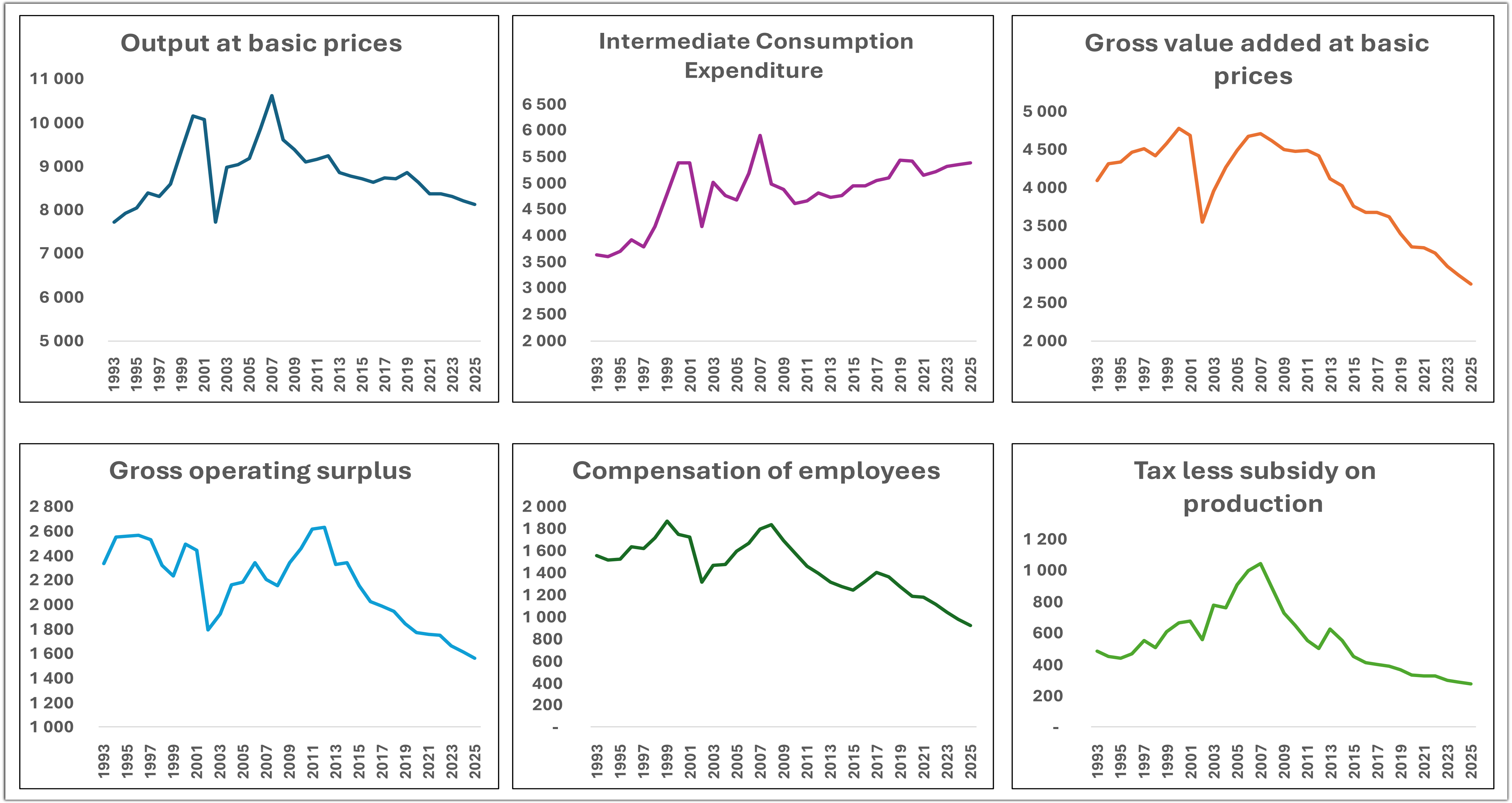



| | March 2023 | % | March 2024 | % |
|---|---|---|---|---|
| Western Cape | 1569 | 9,1% | 1635 | 9,5% |
| **Eastern Cape** | **678** | **3,9%** | **704** | **4,1%** |
| Northern Cape | 504 | 2,9% | 526 | 3,1% |
| Free State | 859 | 5,0% | 865 | 5,0% |
| KwaZulu-Natal | 3 204 | 18,5% | 3 219 | 18,7% |
| North west | 1 902 | 11,0% | 1 773 | 10,3% |
| Gauteng | 4 220 | 24,4% | 4 196 | 24,4% |
| Mpumalanga | 2 581 | 14,9% | 2 506 | 14,5% |
| Limpopo | 1 762 | 10,2% | 1 802 | 10,5% |
| **South Africa** | **17 279** | **100%** | **17 227** | **100%** |

Source: Statistics South Africa, 2024

# Performance, trends & projections of the Eastern Cape electricity sector (1993 – 2025)

The increase in intermediate consumption expenditure suggests that the sector is experiencing rising operational costs. Load shedding exacerbates this issue

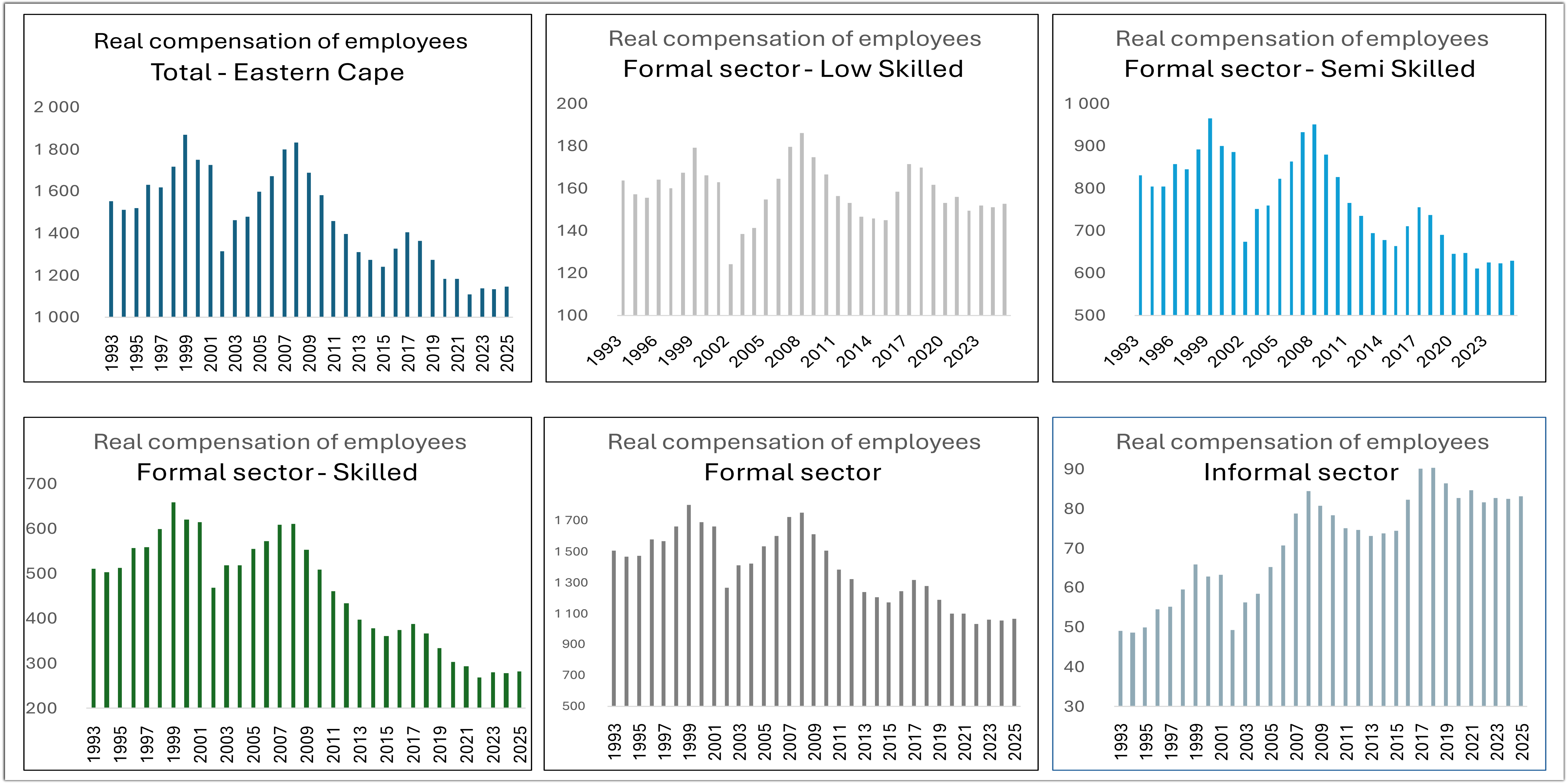



*Source: Stats SA (2023), Quantec Easy data (2023)*

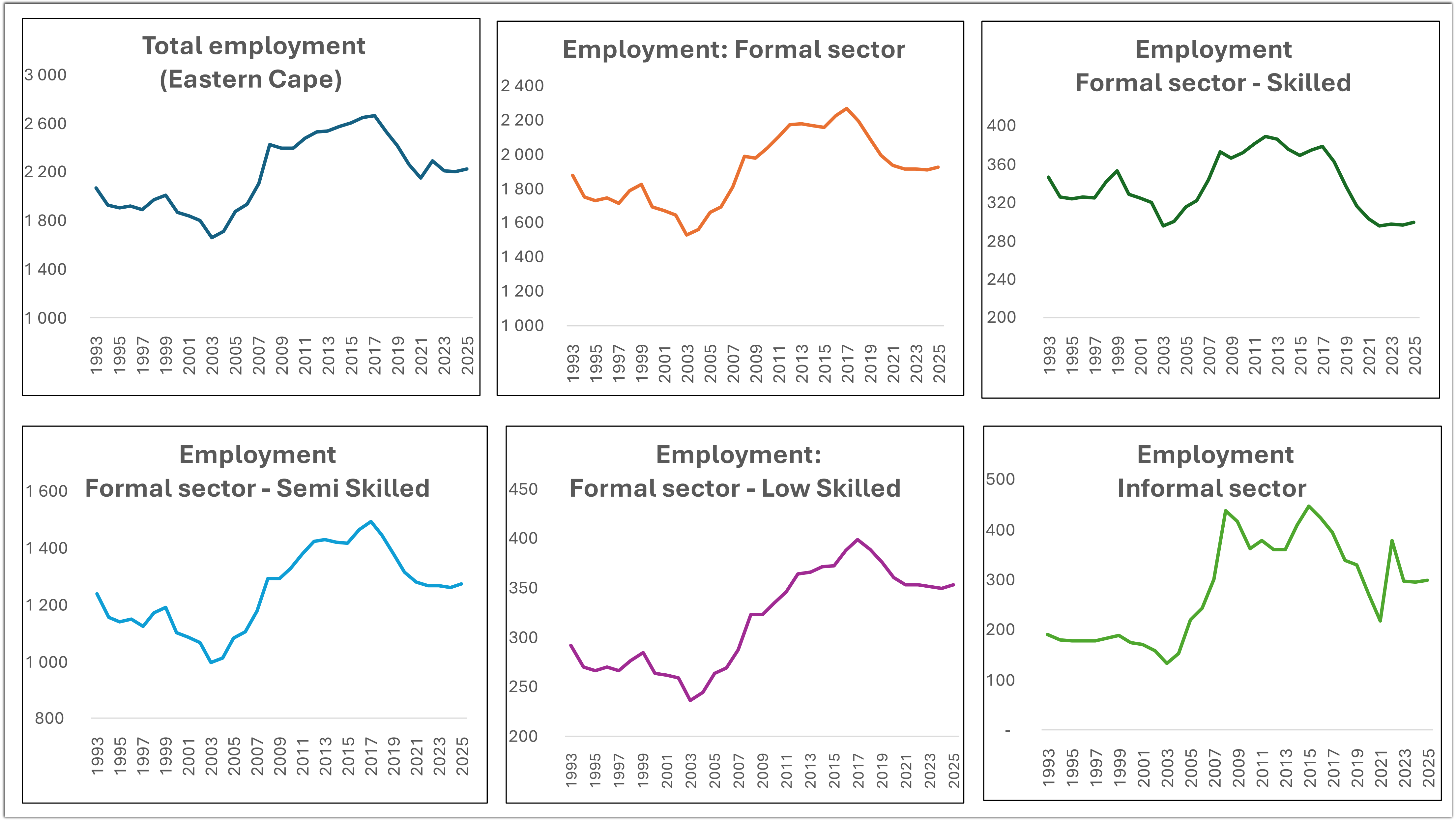
***Note**: Values are provided in R millions constant 2015 prices*

# Real wages (R million constant 2015 prices) in the Eastern Cape energy sector

The rise in informal sector wages alongside the decline in formal sector compensation suggests a shift towards informal employment, potentially indicating labor market instability, reduced job security, and weaker economic growth in the formal sector



# Labour trends & projections of the Eastern Cape Electricity Sector (1993 – 2025)



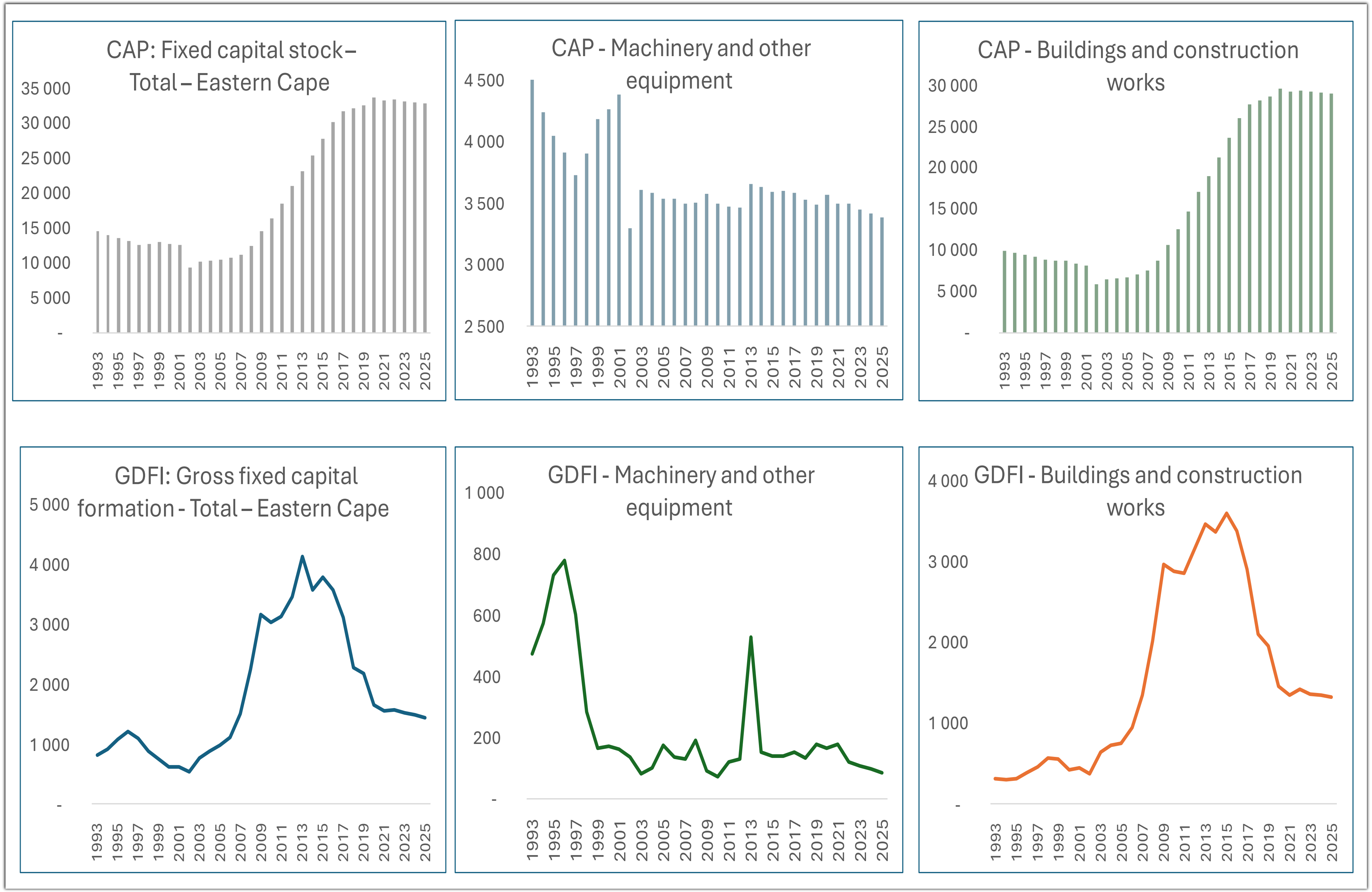
## Distribution of wages and salaries in the Eastern Cape formal and informal energy sector

| | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 | 2025 |
|---|---|---|---|---|---|---|---|
| **Real CoE in the formal sector** | **97%** | **96%** | **96%** | **95%** | **94%** | **93%** | **93%** |
| *Formal sector - Skilled* | *34%* | *35%* | *35%* | *32%* | *29%* | *26%* | *25%* |
| *Formal sector - Semi Skilled* | *53%* | *51%* | *51%* | *52%* | *53%* | *55%* | *55%* |
| *Formal sector - Low Skilled* | *10%* | *9%* | *10%* | *11%* | *12%* | *13%* | *13%* |
| **Real CoE in the informal sector** | **3%** | **4%** | **4%** | **5%** | **6%** | **7%** | **7%** |
| **Tral CoE : Total Eastern Cape** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** |

## Percentage share of employment in the Eastern Cape energy sector

| | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 | 2025 |
|---|---|---|---|---|---|---|---|
| **Employment in the formal sector** | **91%** | **91%** | **88%** | **85%** | **83%** | **88%** | **87%** |
| *Formal sector - Skilled* | *17%* | *18%* | *17%* | *16%* | *14%* | *14%* | *13%* |
| *Formal sector - Semi Skilled* | *60%* | *59%* | *58%* | *55%* | *54%* | *58%* | *57%* |
| *Formal sector - Low Skilled* | *14%* | *14%* | *14%* | *14%* | *14%* | *16%* | *16%* |
| **Employment in the informal sector** | **9%** | **9%** | **12%** | **15%** | **17%** | **12%** | **13%** |
| **Total employment (Eastern Cape)** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** |

# Trend analysis and forecast of Investment in the Eastern Cape energy sector (R millions constant 2015 prices)




The sharp decline in the investment in machinery and other equipment suggests a potential underinvestment in technological upgrades and essential machinery necessary for efficient electricity production and distribution.

This could undermine long-term sustainability and efficiency of the energy sector.

## Objective 2: Impact of load shedding on the Eastern Cape economy and labour

- The results show the economic ramifications of load shedding and its adverse effects on the Eastern Cape's economy. **Load shedding results in a 2.841% contraction in GDP**, significantly hampering economic activity.

- The load shedding has profound and wide-ranging effects on employment. Findings reveal that **employment will decrease by 2.109%,** reflecting job losses due to reduced production. Stabilizing the energy supply can help protect and create jobs, addressing high unemployment, especially in the Eastern Cape, a province with the highest unemployment rate in the country.

- Load shedding **strongly affect energy-intensive sectors**, including manufacturing (-5.427%), mining (-2.903%), agriculture (-3.039%), and wholesale and retail trade (-4.047%), leading these sectors to experience substantial declines in output. The negative impact on the manufacturing sector is detrimental to industrialisation. In the first quarter of 2024, the manufacturing sector declined tremendously.

# Objective 3: Impact of expansionary fiscal policy in the energy sector

- What is the effect of R1 million increase in government spending in the Eastern Cape electricity sector? The results show that for every R1 million invested in the energy sector, the total production output in the provincial economy increases by R3.6358 million. Strategic government investments can significantly boost total production output throughout the entire provincial economy. High multipliers implies the substantial economic impact of energy sector investments.

- An increase in government spending of R1 million results in a R1.7025 million rise in the Gross Value Added (GVA) of the economy. Implication: Such investments are crucial for enhancing economic value creation.

- The results show CoE multiplier (0.6908) and GoS multiplier (0.9902). These multipliers highlight the potential for boosting wages & salaries (CoE) and business profitability ( high return on investment - GoS) through government expenditure. Income and employment multipliers demonstrate significant potential for poverty reduction and improved well-being, highlighting that investing in the energy sector can be a powerful tool for socio-economic development.

# Multipliers per R1 million investment in energy sector: Impact on macroeconomic indicators

| EC - Energy Sector (Electricity) | Initial impact | First round | Direct impact | Indirect effect | Total (Direct + Indirect) | Induced impact | Economy-wide impact |
|---|---|---|---|---|---|---|---|
| Output | 1,00000 | 0,39678 | **1,39678** | 0,92221 | **2,31899** | 1,31681 | **3,63580** |
| Gross Value Added | 0,60322 | 0,15036 | **0,75357** | 0,41390 | **1,16747** | 0,53506 | **1,70254** |
| Copensation of employees | 0,17113 | 0,07894 | **0,25008** | 0,18259 | **0,43267** | 0,25820 | **0,69087** |
| Gross Operating Surplus | 0,43164 | 0,06852 | **0,50017** | 0,22498 | **0,72515** | 0,26507 | **0,99022** |
| Input Cost (ICE) | 0,39678 | 0,24643 | **0,64321** | 0,50831 | **1,15152** | 0,78174 | **1,93326** |
| Employment (Total) | 0,53495 | 0,51059 | **1,04554** | 1,40211 | **2,44765** | 2,67565 | **5,12329** |

# Objective 4: Case study: Impact of a R21.9 billion IPPPP investment in renewable energy

- What is the impact of a R21.9 billion Independent Power Producers Procurement Programme (IPPPP) investment on job creation across different demographics and sectors? The results are provided under four scenarios.

- **The first scenario** shows job creation with **gender and age disparities**. The investment creates 112,200 jobs, with a disparity of 65,893 jobs for males and 46,307 jobs for females. Of the total jobs, 67,924 are for adults and 44,276 for youth. Policies should aim to enhance youth and female employment opportunities in the renewable energy sector.

- **The second scenario** shows job creation for **people with different levels of education**. Few jobs are created for people with tertiary education. The largest number of jobs are created for individuals with secondary education (35,236 jobs) and those who have completed secondary education (36,622 jobs).

- **The third scenario** shows that the investment creates 83,034 jobs in **the formal sector** and 15,932 in the informal sector, with 86,023 jobs in urban areas compared to 26,177 in non-urban areas. Ensuring equitable job distribution between urban and rural areas is vital for balanced regional development.

- **The last scenario** is for skill development. The investment leads to the creation of 22,405 jobs **for skilled workers**, 53,898 for semi-skilled, and 32,688 for low-skilled workers. Focusing on skill development can enhance productivity of the workforce in the renewable energy sector.

**Net impact of load shedding and R29.9 billion IPPPP investment in renewable energy**

| Indicator | Description | Unit | Baseline (2022) | Simulation results (% change) |
|---|---|---|---|---|
| | | Load Shedding | IFPPPP Project | (Net effect) |
| GDPR_EC | Gross domestic Product | R million (Constant Prices) | R365 916 | -2.841% +5.981% (+3.140%) |
| TOVER_EC | Turnover (Total production output) | R million (Constant Prices) | R960 097 | -3.012% +7.604% (+4.592%) |
| EMPL_T_EC | Total number of people employed (formal and informal) | Number (1000) | 1 373 | -2.109% +8.172% (+6.063) |
| UEMP_T_EC | Total number of people unemployed | Number (1000) | 1 082 | +1.896% |
| UNEM_R_EC | Unemployment rate (Official definition) | Percentage | 44% | +0.701% -1.926% (-1.225%) |
| GDFI_EC | Gross Domestic Fixed Investment | R million (Constant Prices) | R45,659 | -1.427% +3.617% (+2.190%) |
| | | | | |

Source: Simulation results from the EC Social Accounting Matrix _SAM Model, 2022

Note: The column for simulation results (% change) contains three findings:

- Impact of Load Shedding
- Impact of IFPPPP Project
- (Net effect)

**Net impact of load shedding and R29.9 billion IPPPP investment in renewable energy**

| Indicator | Description | Unit | Baseline (2022) | Simulation results (% change) |
|---|---|---|---|---|
| | | Load Shedding | IFPPPP Project | (Net effect) |
| OUTP_MAN | Total production output in the manufacturing sector | R million (Constant Prices) | R 220,503 | -5.427%<br>+8.712%<br>(+3.285%) |
| OUTP_MIN | Total production output in the mining sector | R million (Constant Prices) | R 5,706 | -2.903%<br>+3.134%<br>(+0.231%) |
| OUTP_AGR | Total production output in the agriculture sector | R million (Constant Prices) | R 27 923 | -3.039%<br>+5.403%<br>(+2.364%) |
| OUTP_TRA | Total production output in the wholesale & retail trade sector | R million (Constant Prices) | R 151,678 | -4.047%<br>+6.104%<br>(+2.057%) |

Source: Simulation results from the EC Social Accounting Matrix _SAM Model, 2022

Note: The column for simulation results (% change) contains three findings:

- Impact of Load Shedding
- Impact of IFPPPP Project
- (Net effect)

# Net effects

The Microsimulation results show that investment in renewable energy mitigates the effects of load shedding.

- Enhancements in total production output (net increase of 4.592%), GDP growth (net increase of 3.140%), employment (net increase of 6.063%), and investment (net increase of 2.190%).
- This investment revitalizes key sectors, increases industrial output, and promotes long-term economic stability. For example, results show that while load shedding contracts GDP by 2.841%, the IPPPP investment boosts it by 5.981%, resulting in a net positive effect of 3.140%. This indicates that renewable energy investments can not only mitigate the economic losses caused by load shedding but also foster growth beyond the baseline.
- Overall, the injection of R29.9 billion from the IPPPP into renewable energy in the Eastern Cape is a robust countermeasure against the detrimental effects of load shedding. It has the potential to stimulate economic growth, increase production output, create jobs, and attract further investments. Policymakers should leverage this opportunity to enhance energy infrastructure, promote sustainable development, and ensure long-term economic resilience for the province

# Reflection and recommendations

- Provide tax incentives, grants, and subsidies to encourage private sector investment in renewable energy.
- Invest in upgrading machinery and equipment to improve capital productivity and ensure a reliable electricity supply.
- Support the adoption of advanced technologies in the energy sector to enhance efficiency and reduce operational costs.
- Formulate an integrated energy policy that addresses both immediate and long-term energy needs.
- Focus on sustainable energy production and distribution to reduce dependency on non-renewable energy sources and mitigate the impacts of load shedding.
- Promote the growth of renewable energy projects in rural regions to create jobs and stimulate local economies.

# List of Research Papers Conducted in 2024/2025

***By Kambale Kavese***

# Paper 2. Modelling NEET Determinants and Advancing Youth Economic Participation in the Eastern Cape: An ARDL-Based Approach to Structural Marginalisation

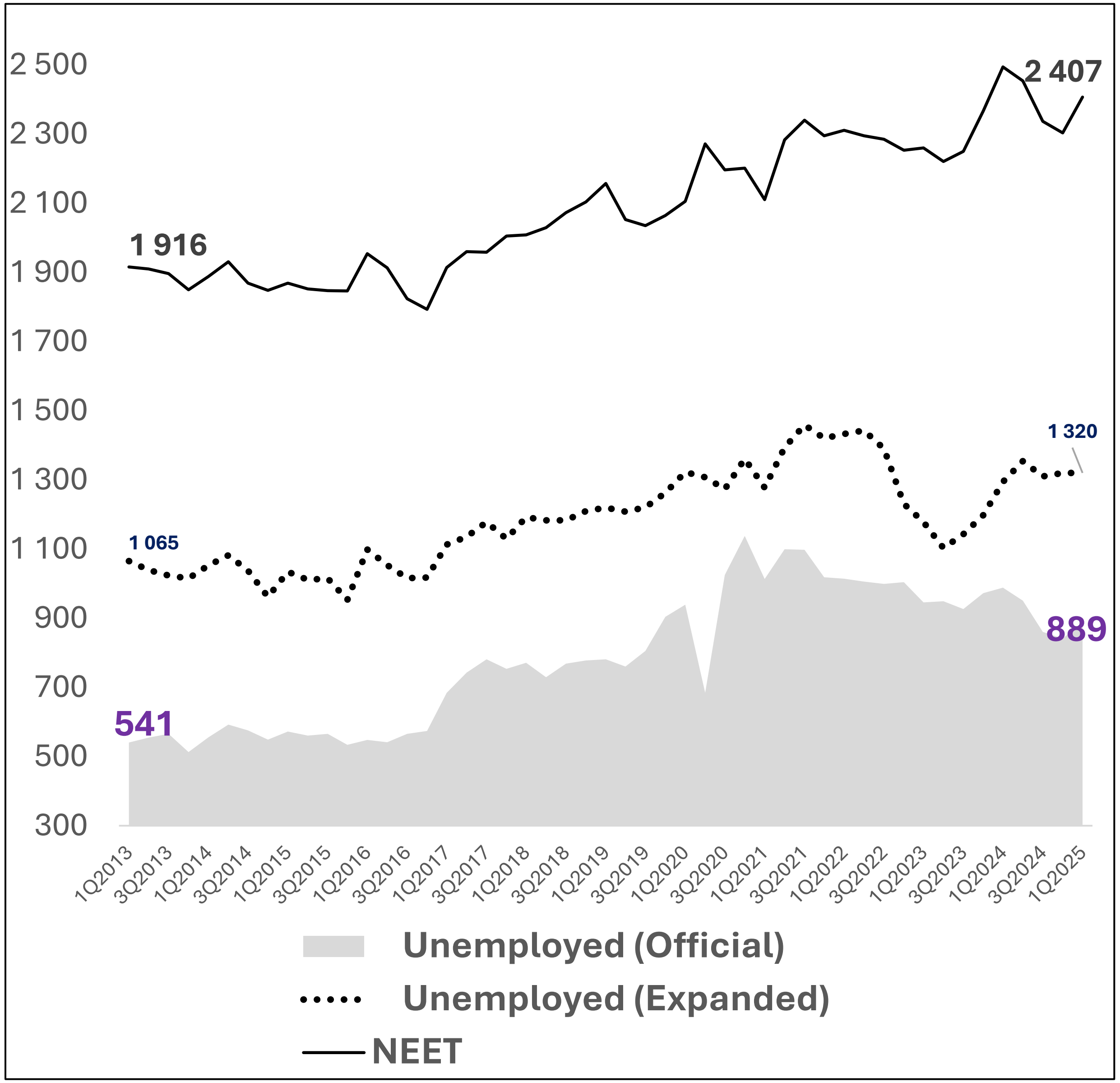
This study set out to empirically investigate the determinants of youth Not in Employment, Education, or Training (NEET) in the Eastern Cape, and to assess policy implications for addressing structural youth exclusion. We employ the Autoregressive Distributed Lag (ARDL) model to examine both the long- and short-run determinants of NEET among youth, using Stats SA's Quarterly Labour Force Survey data.

The findings reveal that the youth unemployment rate is the most influential long-run driver of NEET, significantly increasing the proportion of disengaged youth. Interestingly, the dependency ratio and informal sector activity show negative relationships with NEET, suggesting that economic pressure and informal work can act as engagement mechanisms for youth. Real GDP growth and the youth population share, while important macro indicators, do not exhibit statistically significant long-run effects.

However, in the short run, real GDP growth was found to reduce NEET rates, although with lagged effects, suggesting that economic expansion gradually facilitates youth re-engagement. The informal sector was shown to serve as a temporary buffer for disengaged youth. Notably, the Error Correction Term (ECT) coefficient of −0.5908 implies that approximately 59% of any short-run deviation from the long-run equilibrium is corrected within a quarter, indicating a relatively rapid adjustment speed. This implies the responsiveness of NEET status to macroeconomic and labour market dynamics. These insights call for integrated, dynamic policy responses targeting youth employment, informal sector inclusion, and responsive labour market strategies

# Paper 3. Beyond Youth Unemployment: Addressing NEET Status to Tackle Structural Youth Exclusion in the Eastern Cape

| 1Q2025 - QLFS TOTAL NEET (000) | South Africa | Eastern Cape |
|---|---|---|
| Official unemployment | 8 228 | **889** |
| Expanded unemployment | 12 692 | **1 320** |
| NEET | 19 031 | **2 404** |
| | | |
| GAP (NEET - Unemployed) | 10 803 | **1 515** |



# Paper 4. Eastern Cape Economic Resilience Index

**Economic resilience** refers to a region's ability to withstand, recover from, adapt to, and transform in response to economic shocks and crises. The Economic Resilience Index (ERI) is a composite measure designed to assess an economy's capacity to absorb disruptions, maintain functionality, and promote long-term growth despite adverse conditions (OECD, 2021). It offers a multidimensional framework for evaluating economic stability by integrating key indicators that reflect both structural strengths and vulnerabilities (Hafele et al., 2022).

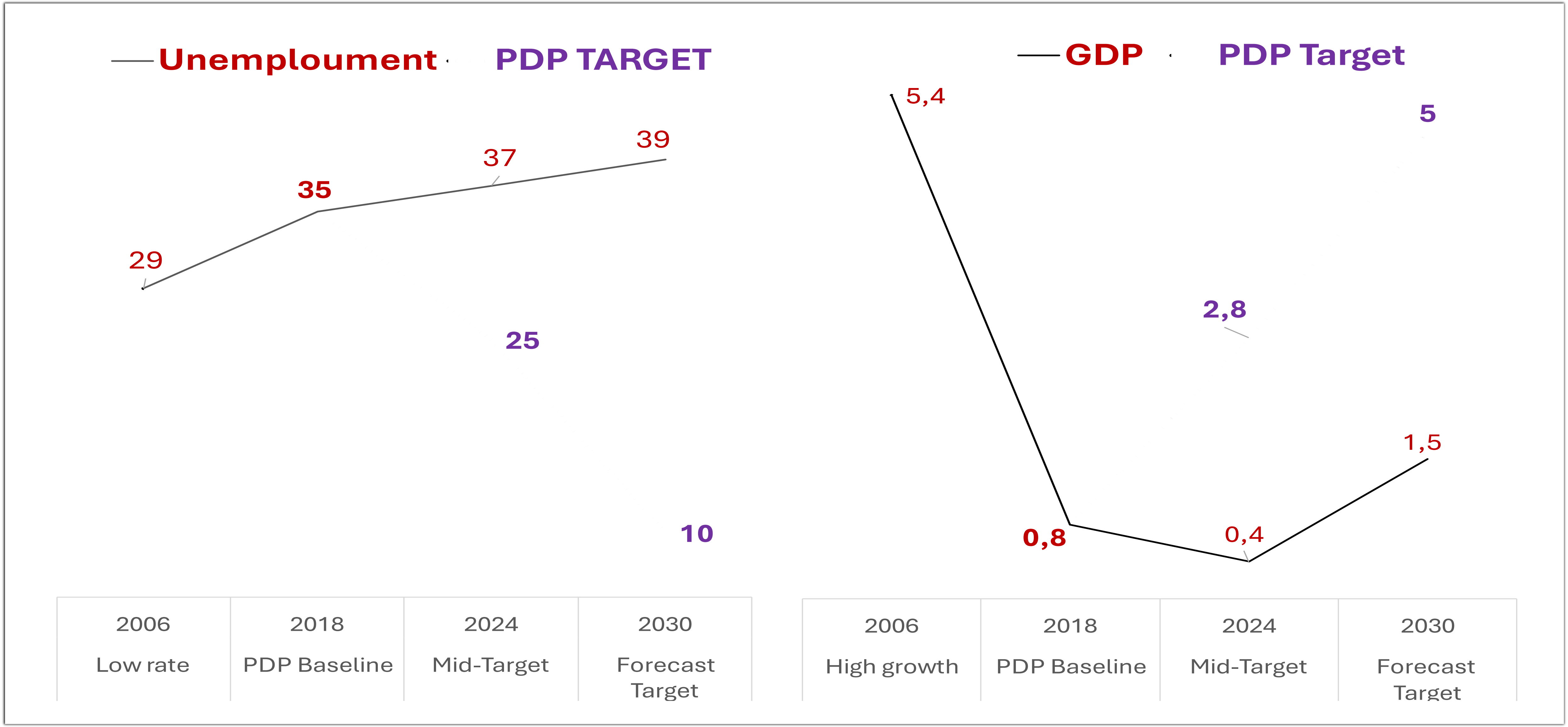
**This study aims** to develop a composite Economic Resilience Index (ERI) and rank South African provinces based on their relative economic resilience. It adopts the European Commission's methodology and incorporates best international practices from the World Bank, moving beyond GDP as the sole indicator of economic performance. The composite indicators used to construct the ERI include macroeconomic stability, economic diversification, innovation and productivity, institutional governance, infrastructure development, and human capital (Hafele et al., 2022).

**The findings** reveal that the Eastern Cape, with an ERI score of 0.4221, falls within the moderate resilience category, highlighting a fragile balance between economic potential and vulnerability.

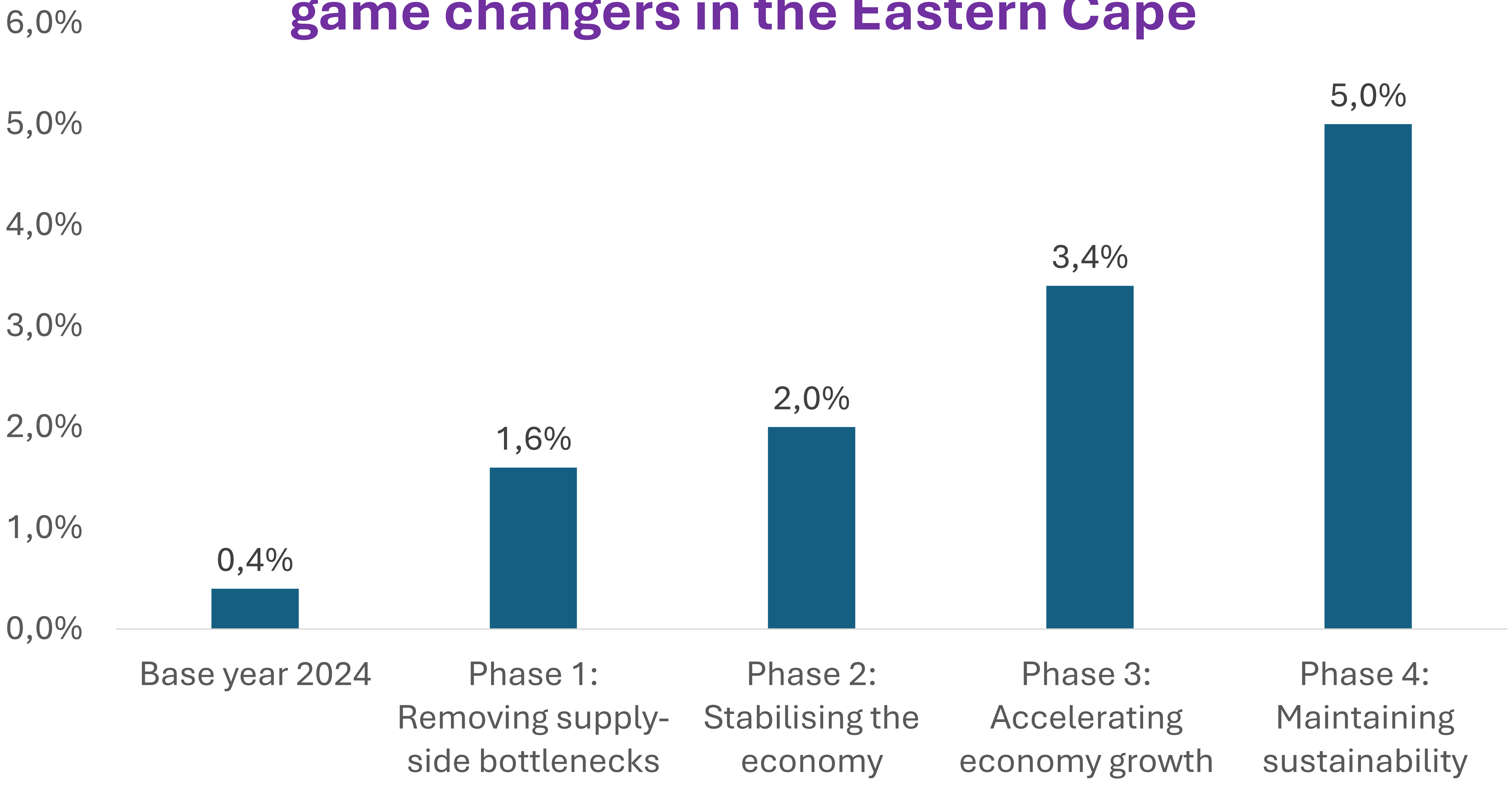
**The methodology** comprises four main steps: (1) defining the dimensions of resilience; (2) selecting appropriate indicators; (3) normalizing the indicators using three techniques—Min-Max normalization, Z-score normalization, and geometric mean calculation; and (4) computing the overall index.

# Paper 5 PROPOSED GAME CHANGERS IN THE EASTERN CAPE

**Unemployment is heading to 39% instead of 10%, and GDP is heading to 1.5% instead of 5.0%**



# A nuanced-phased approach for implementing game changers in the Eastern Cape



# Paper 6 An Overview and Empirical Analysis of the Eastern Cape Sectoral Employment Intensity of Growth

The purpose of this study is to report on selected labour market indicators, investigate various methods for estimating sectoral employment intensity of growth, and provide empirical evidence on the relationship between GDP growth, employment, and unemployment in the Eastern Cape.

The analysis began with the estimation of Arc Employment Elasticities (AEE) to measure the responsiveness of employment to a 1% increase in GDP. This was followed by the application of an Ordinary Least Squares (OLS) model to examine the relationship between exogenous and endogenous variables. Additionally, Okun's law was used to evaluate the link between GDP growth and unemployment. Lastly, an economy-wide Leontief multiplier model, developed by ECSECC, was employed to estimate employment and income multipliers for the province.

The findings suggest that economic performance has done little to reduce unemployment in the region. The results indicate that the province has not been efficient in translating economic growth into a reduction in unemployment, both in the short and long term. Employment elasticities derived from the OLS model, as well as employment multipliers from the Leontief model, reveal a stronger impact in the tertiary sector compared to the primary sector

# Paper 7 The role of business resilience during economic downturns

**Business Establishments and Resilience During Economic Downturns in the Eastern Cape**

Business establishments play a critical role in job creation and sustainable economic development. However, the Eastern Cape has recently faced economic challenges, entering a technical recession following three consecutive quarters of negative growth, namely, Q3 and Q4 of 2023, and Q1 of 2024. This study investigates how local businesses respond to economic shocks. It focuses on the interlinkages between: (1) Business establishments and GDP growth, (2) Employment and earnings, and (3) The number of taxpayers and personal income tax contributions. These factors are vital for informed policymaking and long-term planning.

According to data from SARS (2022), The Eastern Cape had **27,331 business establishments**, accounting for only **6.2%** of South Africa's total. Total earnings in the province were **R638.9 billion**, also making up **6.2%** of national earnings. Personal income tax revenue collected in the Eastern Cape amounted to **R140.8 billion**, contributing a slightly higher **6.8%** to the national total. The province had **489,993 taxpayers**, representing **8.2%** of South Africa's taxpayer base.

A key finding of the study is the concerning decline in the number of taxpayers, which has not kept pace with the increase in business establishments. This disconnect may point to issues such as low tax compliance, underemployment, or a growing informal economy. Furthermore, the province's earnings have shown limited growth relative to broader economic indicators. This stagnation may suggest that wages are not rising in line with inflation or the increasing cost of living.

Additional data from SARS (2022) shows that: Nationally, South African citizens accounted for **96.0%** of total earnings, compared to **97.8%** in the Eastern Cape. Permanent residents contributed **0.8%** nationally and **0.4%** in the province. Foreign nationals made up **3.2%** of earnings nationally, and just **1.8%** in the Eastern Cape.

These figures highlight the Eastern Cape's structural economic vulnerabilities and underscore the importance of targeted, evidence-based interventions to strengthen resilience, broaden the tax base, and ensure more inclusive economic participation.

# Paper 8 The state of food security, hunger, and malnutrition in the Eastern Cape

This study investigates the prevalence of hunger and malnutrition in the province. Using raw data from South Africa's General Household Survey (GHS), the research examining seven critical dimensions of food insecurity: (1) Insufficient food for adults, (2) Lack of nutritious food,(3) Skipped meals, (4) Running out of food, (5) Hunger, (6) Going without food for an entire day, and (7) The impact of school feeding programs on alleviating child hunger.

It evaluates the role of the agricultural sector in promoting food security and driving economic growth in the Eastern Cape. Additionally, it analyses trends in severe acute malnutrition (SAM) and moderate acute malnutrition (MAM), while assessing key socioeconomic indicators that influence food insecurity, hunger, and malnutrition. Through this approach, the research aims to offer insights that will inform policies and strategies to enhance food security and improve overall well-being in the province.

# Paper 9 The 2024 Eastern Cape Socio-Economic Review and Outlook (EC SERO)

The 2024 EC SERO presents a comprehensive assessment of the global, national, and provincial economic landscapes, evaluating the effectiveness of current government policies. This evidence-based, data-driven analysis delves into the latest economic trends and socio-economic developments, offering insights that are crucial for policy making, planning, and budgeting processes in the Eastern Cape. With a focus that spans descriptive, analytical, and prescriptive approaches, the report examines critical development issues and key indicators of service delivery across the province. Additionally, it provides updates on the progress of the Eastern Cape Provincial Development Plan (EC PDP) implementation, discusses potential adjustments to the 2030 PDP targets in light of the Eastern Cape Apex indicators, and anticipates future planning scenarios.

This report systematically addresses a range of thematic areas, including: (1) Demographic trends and population dynamics. (2) Human development initiatives. (3) An economic overview and employment patterns. (4) Basic services delivery and infrastructure development. (5) The progression towards a democratic developmental state in the Eastern Cape. (6) Projected scenarios for 2040 and their expected repercussions. (7) A recapitulation of the EC PDP and the milestones achieved over the past 30 years.

**Task 10** The University of Johannesburg (UJ) was commissioned to conduct three key studies:

1. Develop the EC Ocean Economy Satellite Account
2. Construct the Social Accounting Matrix (SAM) to model the Eastern Cape Ocean Economy.
3. Development of an economy-wide SAM-based Leontief model, including the application of related micro-simulation techniques.

**My role included drafting** the Terms of Reference (ToR), verifying the service provider's (UJ) outputs for compliance and alignment with international standards, specifically the United Nations System of National Accounts (SNA) and the European System of Accounts (ESA). Rerunning the models, and reporting on their accuracy and reliability.

**My involvement focused on**:

- Evaluating the EC Satellite Account's conformity with the SNA 2008 and ESA 2010 frameworks.
- Reviewing the construction and structure of the SAM for the EC Ocean Economy.
- Validating the Leontief-based economy-wide model and assessing the micro-simulation methodologies applied.

**The review process involved:**

(1) Validating the SAM model structure and sub-matrices, including trade flows. (2) Examining core SAM components: activities, factors, institutions, commodities, rest of the world (ROW), and capital accounts. (3) Ensuring sectoral coherence, such as the alignment between household accounts and income, and the consistency between Compensation of Employees (CoE) and Gross Operating Surplus (GoS). (4) Assessing the treatment of missing, negative, and zero values within the model. (5) Comparing the structure of the micro-SAM vs. macro-SAM and evaluating the appropriateness of open vs. closed models. (6) Reviewing the formulas and accounting identities used in the SAM framework. (7) Evaluating the estimation techniques, including entropy and regression-based methods. (8) Assessing how the model was calibrated, including the calculation of calibrated parameters (e.g., $\alpha$, $\beta$). (9) Reviewing the balancing methods, such as the RAS and cross-entropy techniques. (10) Identifying key assumptions, including homogeneity, constant returns to scale, and fixed technical coefficients. (11) Verifying the application of appropriate price valuations (basic prices vs. purchaser prices). (12) Checking for consistency with Integrated Economic Accounts (IEA). (13) Confirming internal consistency across SAM accounts: labour and capital income flows, household income and expenditure, CoE and GoS alignment. (14) Ensuring adherence to appropriate industry and product classifications (e.g., based on SIC and CPC codes). (15) Confirming overall compliance with the 2008 SNA guidelines.

This process ensured that the models developed are not only technically sound but also aligned with international best practices and suitable for robust policy analysis

# Thank you

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