SOUTH AFRICA'S JUST ENERGY TRANSITION: REGIONAL IMPACT ON INCOME INEQUALITIES AND INDUSTRIES

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Overview

The transition to a cleaner energy mix is critical for addressing global challenges such as climate change and inclusive socio-economic development, particularly in developing countries like South Africa. However, this shift is accompanied by complex economic and social trade-offs, including potential widening income inequalities, regional disparities, and labour market challenges. South Africa, heavily reliant on coal, faces unique pressures to balance its energy needs with environmental goals while addressing historical inequities and ensuring no one is left behind (LNOB) (Bohlmann et al., 2023). Existing research underscores the need for in-depth policy interventions that mitigate these challenges, particularly in regions like Mpumalanga, where coal decommissioning could have significant economic consequences (Bohlmann et al., 2019; 2023). This research study aims to investigate the national and regional economic implications of South Africa's energy transition from coal to cleaner energy sources, focusing on the impacts across regions and household groups. Using a regional Computable General Equilibrium (CGE) model, the study examines how changes in the energy supply mix influence household, sectoral and provincial economic inequalities.

Research Objectives

- To evaluate the impact of South Africa's energy transition on households of different income levels across various provinces, examining whether and how different transition pathways can potentially intensify existing income inequalities.

- To assess the impact of the energy transition on economic sectors across different provinces in South Africa, focusing on how sectoral shifts influence regional economic dynamics and contribute to socio-economic disparities.

Methods

This research utilises the TERM-SA model, a bottom-up regional dynamic computable general equilibrium (CGE) model for South Africa. The model was developed in collaboration with the Centre of Policy Studies in Melbourne. It is a well-documented model that offers detailed insights into regional and economic dynamics. Key characteristics of the model include:

- Regions: 9 provinces, allows for targeted region-specific shocks and analysis

- Industries: 60 industries, 4 different electricity generating industries

- Occupations: 10 occupation types (can be expanded using SAM data)

- Households: 48 households (12 income groups, 4 ethnic groups)

- Taxes: 6 tax types on products (TLSP), more tax types for provincial governments

- Government: national and provincial governments, GFS module

- Other: follows TERM theoretical specification implemented on SA database

Baseline

- The baseline for the model reflects the 2019 Supply-Use Table structure, with macro components updated to reflect end-of 2022 values

- Business-as-usual baseline forecast for 2023-2050 follows typical CGE conventions including closure swaps to allow for sensible macro forecasts

- Real GDP grows at an average annual rate of 2.33% between 2023 and 2050 (GDP beyond 2030 set at 2.5% based on current SARB steady state)

Results

In this paper, we quantify the economy-wide effects of three different energy transition pathway scenarios to help determine where additional interventions and mitigation may be necessary to ensure it is also a just transition. Modelling and research design were done in consultation with policymakers and stakeholders to help inform our simulation design processes. Overall, the Mpumalanga economy will be unavoidably smaller in the long run in a relative sense, unless large offsetting interventions are introduced (but opportunity costs should be considered), growth in other provinces will offset this effect at a national level. Impact on specific jobs over time requires further research, including regional migration effects, but lower-skilled workers will be more vulnerable. Other interventions (localisation) or spillover effects (TFP, health) may be analysed separately from the effects of the energy transition.

Based on the key results of the research, which highlight that with no additional mitigation strategies employed, the Mpumalanga economy will be 14% to 20% smaller post-transition relative to a no climate change and no transition BAU scenario representing the status quo, lower household income groups will be slightly worse affected

Additionally, the Cape provinces stand to benefit most in the long run from increased investment and renewable generation activity, however, infrastructure needs must be noted.

At the national level impacts show slight GDP gains in the long run driven by increased investment activity, although possible crowding out may be overstated.

Conclusions

The results highlight the urgent need to carefully plan, communicate, and implement mitigation strategies in the Mpumalanga province to limit the (relative) losses its economy is likely to suffer due to the energy transition. Should such mitigation plans be in place, a fast transition scenario will produce relatively better macroeconomic results (also for decarbonisation targets). A slower transition scenario may look better for Mpumalanga, but comes at the expense of i) slower investment elsewhere, ii) higher emissions, iii) risk of CBAM-type export competitiveness losses, and iv) falling behind non-BAU required needs.

Any transition scenario will look better in the long run than an unmitigated climate change baseline scenario that also penalises high-emissions economies. Workers in lower-skilled jobs and lower-income household groups will require support to manage the transition without widening inequality.

References

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