

South Africa's Energy Policy: Opportunities and Constraints for Economic Growth and Employment

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South Africa's electricity supply challenge

As recent events have illustrated, South Africa (SA) is now being confronted with the reality of a prolonged, possibly multi-year, period of intermittent load shedding. SA's inability to ensure a reliable and sustainable electricity supply to the economy has without a doubt been an important contributor to the countries' low economic growth and inability to create jobs and economic opportunities for its citizens.

Local air pollution, and the severe health impacts as a result of this, are of increasing concern to citizens. SA is a disproportionate contributor to climate change and its power generation is largely coal-based. While not yet widely appreciated in SA, this situation poses a rapidly growing risk for the economy. By 2030, global coal use in electricity generation will have to be reduced by 80% below 2010 levels in order to avoid the worst economic impacts of climate change. The world economic system is responding to this unprecedented crisis. The momentum of financial markets and their regulators to restrict the financing of coal-based economic activity is rapidly escalating. This will add to Eskom's financial woes (and those of Sasol and other SA energy intensive industries) and poses severe risk to the entire economy and financial system.

The structure of SA's electricity sector is from a bygone era when the pursuit of ever-larger economies of scale in coal-fired power generation required the establishment of a large monopoly (Eskom) in an attempt to reduce the cost of funding its ever-growing power station mega-projects.

The global power sector is now undergoing a fundamental technological disruption with renewable energy, storage, and information technology

combining to displace the centralised power generation model with smaller, cleaner and cheaper technologies.

Despite Eskom's best efforts and repeated commitments to improve the situation, the perilous state of its old and new plants will result in random ongoing excessive plant failures for the foreseeable future.

While the situation is indeed dire, SA is in the fortunate position that due to its exceptional wind and solar resource endowment, available land and developed financial sector, it is possible to navigate through this crisis by adopting a different industry model in line with international best practice. The broad outline of this strategy has already been set out in the latest update of the Integrated Resource Plan, which sees the bulk of new power coming from wind and solar resources combined with complementary technologies (gas, battery storage, etc.) to maintain security of supply.

Furthermore, rolling out these new, lower cost, cleaner and smaller-scale generation technologies creates a critical opportunity to move away from the fundamentally problematic monopoly model in the power sector. A new paradigm with a greater role for broad-based participation, innovation and competition is thus required. It is now possible to procure and finance power generation on a competitive basis, thereby opening up broader economic opportunities.

Therefore, to conceive the solution to SA's power problems by simply "fixing Eskom" is to misdiagnose the problem and overlook the immense opportunities for power sector-driven green industrialisation.

Integrating industrial policy and energy policy

If SA successfully manages its energy transition to a reliable, low-carbon, least cost energy supply, this will have significant implications for the country's industrialisation potential. By integrating the expansion in renewable energy generation capacity with active industrial policy measures, significant potential exists for a Green Industrial Policy for SA, which accelerates growth, investment and employment opportunities.

Such a policy should be based on two key pillars:

- **Localisation of renewable technologies and capabilities** - entailing the localisation of key aspects of the renewable energy infrastructure supply chain; and
- **Building competitive new industries** - using SA's comparatively low-cost renewable energy supply to support the building of new export-oriented industries.

Localisation has significant job creation potential. For example, a comprehensive study conducted in the United States (US) found that in recent years solar photovoltaic (PV) and wind employed 475 000 people, while nuclear and coal employed 240 000. This was despite the fact that wind and solar PV together supply less than 10% of the US electricity demand, and nuclear and coal supply 60%.²³ Local ownership, including specified ownership by black South Africans, of renewable energy projects could be enhanced by adjusting financing arrangements. Furthermore, the black industrialists' incentive programmes should be calibrated to opportunities arising from the Green Industrial Policy.

Through seamlessly implementing and iteratively recalibrating the integrated resource plan (IRP), it is imperative that noise and uncertainty be removed from SA's roll-out of renewable energy capacity. Uncertainties and stop-start episodes serve to reduce the localisation potential of the programme. For example, the decision by Eskom to refrain from signing power purchase agreements for renewable-energy projects procured in 2015 by government,

resulted in some of the manufacturing capacity that had been developed around the renewable energy programme being closed, including a wind tower manufacturing plant in the Eastern Cape and a solar PV manufacturing plant in Kwazulu-Natal (KZN).

Overcoming backward-looking vested interests to build competitive new industries

In the longer run, the fact that SA has world-class solar and wind potential²⁴ means that the shift towards increased solar PV and wind power has the potential to reduce the rate of electricity price increases, and over time restore international competitiveness for the SA economy in energy-intensive sectors.

This would confer a fundamental advantage to the SA economy in exporting low-carbon, electricity-intensive, hydrogen-rich products, and so-called "green" products such as "green" aviation fuel²⁵, "green" steel and "green" fertilisers and chemicals.

Although renewable energy is included in SA's current "reimagined SA industrial policy", the full potential of this sector is not sufficiently articulated. A clear directive is required that the Green Industrial Policy - dealing with both localisation and the expansion of production of energy-intensive, low carbon-products - should be an industrial policy priority if dynamic, forward-thinking industrial expansion is to be achieved.

SA's industrial policy processes must not be captured by vested interests. Vested interests, that accrue a rent from the current structure of energy production, will need to be engaged as their narrow self-interest stands in the way of SA adopting policies which will move the economy onto a more inclusive, more dynamic growth path.

Vested interests are backward-looking and have the potential to lock the SA economy onto an uncompetitive path not just because they eschew low-cost energy technologies, but also because, due to climate change, high-carbon energy technologies

²³ US Energy and Employment Report, US Department of Energy, January 2017

²⁴ Wind Atlas South Africa and Solar Radiation Data referenced in the Wind and Solar PV Resource Aggregation Study for South Africa undertaken by the CSIR, SANEDI and Fraunhofer IWES, March 2016 https://www.csir.co.za/sites/default/files/Documents/Wind_and_PV_Aggregation_study_final_presentation_REV1.pdf

²⁵ Walwyn, D and Crompton, R "South Africa has huge 'green fuels' potential. But it needs to act now", The Conversation (January 2020), <https://theconversation.com/south-africa-has-huge-green-fuels-potential-but-it-needs-to-act-now-129009>

are increasingly difficult to finance. The articulation and implementation of a Green Industrial Policy in the broad national interest is required. Once a Green Industrial Policy framework is unambiguously in place, it will then be possible to engage with stakeholders to mitigate and ameliorate their position in line with the so-called “just transition”.

A “just transition” should be aligned with the IRP’s roadmap of planned reductions in year-by-year

coal generation requirements.²⁶ This will enable the coal sector to have a higher degree of visibility and certainty for planning purposes. Workers should be supported, even if changing technologies mean that specific jobs cannot be guaranteed, via retraining and re-equipping workers with marketable skills. In addition, where feasible, renewable energy projects should be located in coal-producing areas to keep up economic activity and employment rates in those areas.

²⁶ Table 5 of the Integrated Resources Plan (IRP 2019), South Africa’s Government Gazette 42784, 18 October 2019