Communication and Marketing Department
Isebe loThungelwano neNtengiso
Kommunikasie en Bemarkingsdepartement

Private Bag X3, Rondebosch 7701, South Africa
Welgelegen House, Chapel Road Extension, Rosebank, Cape Town
Tel: +27 (0) 21 650 5427/5428/5674 Fax: +27 (0) 21 650 5628

www.uct.ac.za

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# Transition to renewable energy could result in cheaper, cleaner and more reliable electricity supply for SA

*Phasing out coal in the power sector by 2040 would allow SA to fulfil its commitment to the Paris Agreement goal of limiting warming to well below 2° C without significant impact on the economy.*

South Africa could have cheaper, cleaner and more reliable electricity supply and fulfil its commitment to the Paris Agreement goal of limiting warming if it transitions to renewable energy sooner rather than later.

These are some of the main findings of a new SA-TIED study undertaken by the University of Cape Town's (UCT) Energy Research Centre (ERC). SA-TIED is aunique collaboration between local and international research institutes and the government of South Africa.

The ERC study is an alternative technical assessment of South Africa's future electricity system to inform debate on the draft Integrated Resource Plan (IRP2019) which was recently presented by the Department of Energyto the National Economic Development and Labour Council (Nedlac). The IRP is government's scenario planning for the country's energy needs and is updated regularly to inform policy.

Such debates are critical given the rolling electricity blackouts facing the country. The need for clean energy solutions has also been reinforced by the devastating impact of Cyclone Idai which struck parts of southern Africa. This tragedy once again highlights that any future economic and energy planning scenarios must account for climate change mitigation effort. The ERC assessment does this.

The ERC study finds there is no single or quick-fix solution to South Africa's electricity woes, but rather that a vibrant energy-mix be adopted, to not only save money for consumers, industry and the economy broadly, but also to meet the country's carbon emission targets. Such a mix would include methods to store excess power on grid through utility-scale storage, and off-grid, for example by generating hydrogen, ammonia, and methane, and charging electric vehicles.

## Key Findings

- The study reiterates earlier findings that the future energy supply should come primarily from wind and solar photovolataics (or PV). Renewable energy plus flexible generation or storage provides the least-cost pathway for the electricity sector. No new coal or nuclear power plants should feature in South Africa's electricity future as their inclusion would require subsidies from consumers.

- This study shows that a large-scale procurement programme for battery technology to provide storage capabilities for variable renewable energy should be pursued in South Africa.

- Retrofitting stations for compliance with the minimum emission standards (MES) is, for the most part, the least-cost option for the electricity sector, due to the relatively higher costs of new technologies in the period 2020–2025. It is cost-optimal to retrofit Eskom's coal-fired fleet to meet the new plant standards by 2025 rather than retire them, except in the case of Majuba. There are additional potential cost and greenhouse gas emissions savings if compliance with the new plant standards is completely foregone for certain stations, e.g. Duvha and Matla, and they are instead retired early. The study proposes that the Department of Environmental Affairs considers suspending compliance requirements for the best performing (in terms of pollutants) stations and in exchange Eskom agrees to retire the least-performing stations by 2030 latest. For the remainder of the fleet, Eskom should commence retrofitting the stations for compliance with the MES, subject to ongoing cost assessments, e.g. coal costs per station, which may alter whether a station should be retrofitted or retired.

The study also weighs how much decarbonisation South Africa can and should do without putting the economy at risk. It argues the country should pursue rapid decarbonisation of the electricity sector – i.e. using less coal-powered stations – to avoid additional mitigation costs to the rest of the economy. It finds that phasing out coal in the power sector by 2040 is required for South Africa to fulfil its commitment to the Paris Agreement goal of limiting warming to well below 2° C and this is without significant impact on the economy, and therefore South Africa can afford to be more ambitious in its climate mitigation policy.

One of the key critiques of the draft IRP, the study argues, is that it does not adequately address the central problem of climate change mitigation, even though the electricity sector currently accounts for more than 40% of South Africa's emissions. The ERC assessment takes this into account and provides an economy-wide analysis.

*Disclaimer: Please note the research or its outcomes are not policy positions of the South African government nor do they reflect the views of the partner organisations.

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***Issued by: UCT Communication and Marketing Department***

**Thami Nkwanyane**
**Media Liaison and Monitoring Officer**
Communication and Marketing Department
University of Cape Town
Rondebosch
Tel: (021) 650 5672
Cell: (072) 563 9500

Email: thami.nkwanyane@uct.ac.za
Website: www.uct.ac.za