

Fossil fuel-based energy mix remains a challenge for South Africa

By [Paul Nel](#)

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The main challenge facing South Africa is its fossil fuel-based energy mix that is heavily dependent on the mining industry for supplying coal and employment opportunities. We are very dependent on the government to free up the power generation sector. Here the long-awaited Round 5 of the renewable energy independent power producer procurement (REIPPP) programme stands to come into play.



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Transitioning from coal-based power to renewable energy is a long and complex journey, as witnessed by the government's ongoing efforts to separate the transmission, distribution and generation business units of electricity utility Eskom.

This unbundling is a prerequisite for the freeing up of the electricity market. Eskom's inevitable reorganisation will be a slow process. What we are ultimately hoping for is an independent system operator mandated to trade power between both private and public entities. This will also free up significant investment opportunities for the private sector.

Nuclear power

In terms of nuclear power, it is vital that options are considered to extend Koeberg's operating life in order to ensure stability of the national grid, especially as this is the only dispatchable base-load generation capacity in the entire Western Cape.

New technology such as pebble bed modular reactors, which have disappeared off the radar somewhat in recent years, would likely still have a long development lead-time should focus return to it. Traditional nuclear generation solutions remain very expensive and complex to develop, and hence we believe that additional nuclear power will not be considered an option for South Africa's energy mix in the foreseeable future.

Solar solutions

Africa, in particular, requires robust and durable solutions, which often means that clients prefer tried-and-tested technology rather than the latest cutting-edge innovations. However, it is important that the energy sector remains up-to-

date with the latest R&D in order to assist the market as it matures. This has resulted in a steady advance from fixed-access solar energy to single-access tracking. Bifacial photovoltaic (PV) technologies are also under the spotlight.

An exciting area is the development of hybrid power solutions including thermal, solar PV and battery energy storage systems (BESS). Some of the latest tools are computational design advances in utility-scale PV design, advanced data analytics, cutting-edge drone-based construction monitoring and complex bespoke business decision support solutions. Digitally-advanced solutions actively increase the digital offering in the energy space to ensure it remains relevant in this fast-changing digital world.

African energy projects

The need for both power and water on the continent is growing unabated, especially due to increasing urbanisation and, to some extent, also industrialisation across Africa. Achieving significant traction in the energy market means grappling with difficult problems in the knowledge that, through this, we not only bring tangible relief, but make a significant contribution to the socioeconomic development of Africa. Getting our country back on track in terms of its electricity requirements strong institutional experience across the continent, especially in South Africa.

The energy sector encompasses generation, transmission and distribution, industrial energy and automation and power system studies and planning. All of this has to be taken into account in terms of fully-integrated solutions for a diverse sector that includes international and local project developers, institutional entities such as electricity utilities and local government clients.

In addition, there are major regional initiatives such as the Southern African Power Pool (SAPP) and the East African Power Pool (EAPP), where the main focus is on large interconnector projects. Here projects are underway in South Africa, Uganda, Zambia, Malawi, Kenya, Mozambique, Madagascar, Ghana, Tanzania and Nigeria. Apart from large interconnector studies, the focus here is mainly hydroelectric and solar power, and even wind energy in East Africa, for example.

Energy projects in Africa tend to combine renewable, BESS and even thermal gas. These range from connecting to the grid at the utility-scale level to smaller industrial-scale solar power projects specifically for industry. Here hybrid solutions often provide the best energy mix, especially as battery-storage technology has not yet become cost-competitive with more traditional solutions.

ABOUT THE AUTHOR

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