

Tackling energy security in SA - key approaches to meeting present, future demand

Access to affordable and reliable electricity supply is essential for emerging economies across Africa, both as a basic need of living in the 21st century and a crucial component for participating in the digital era. Following another recent round of load shedding, there has been a concerted call in South Africa to address and relook at the country's energy security to meet the immediate and future demand.



Carlos Carvalho, EMEA energy and utilities leader at SAS

Resolving the local energy crisis, however, is complex, says Carlos Carvalho, EMEA energy and utilities leader at SAS. “The most immediate concern is the threat that continued energy shortfalls pose to the economy, which has already been pummelled by the Covid-19 pandemic.”

In his address in June 2021, President Cyril Ramaphosa announced that energy security is one of the government's priority interventions for its Economic Reconstruction and Recovery Plan, correlating the pace at which it can address the energy crisis directly with the prospects for reviving economic growth.

However, this is not going to be an easy task, stresses Carvalho. “While there is widespread recognition and acceptance that energy is a matter of national security, with digitalisation and electrification currently the biggest challenges that power generation companies face, South Africa has to contend with a perfect storm of three forces that are each bringing pressure to bear.”



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Firstly, the country has aging infrastructure that has not kept pace with available technology or received adequate re-investment for maintenance and upgrading due to a number of prevailing structural and socioeconomic challenges. Secondly, the digitalisation of society and people – which has been amplified amidst the impacts of the pandemic - has dramatically increased reliance on electrification in our personal lives and businesses. And thirdly, the international community is applying pressure to all countries, including across Africa, to move to renewable or more carbon efficient energy sources.

“All things being equal, and on a level playing field, moving to renewables alongside developed nations, would be an easy answer to electricity shortfalls,” says Carvalheira. “However, for many emerging economies that are struggling to keep the lights on, conventional production are still the easiest and most immediate ways to address their power needs. And particularly those that are resource rich, such as South Africa.”

According to Carvalheira it should also be noted that switching to renewable energy is anything but simple. “Firstly, it does not bring with it assurances of a constant flow of energy and rolling it out requires significant amounts of planning. For example, the e-mobility paradigm brings questions around energy flow and distribution challenges on making a network of charging points/stations available to create access for consumers to be able to charge electrical cars on route.”



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Predictive maintenance

This makes maintenance of existing infrastructure imperative. Ideally, reactive maintenance would give way to predictive maintenance, leveraging artificial intelligence (AI) and the internet of things (IoT), where data is utilised to fix problems before affected power plants must be temporarily shut down. That, explains Carvalheira, requires power generation to have been digitised which, in South Africa, it has not.

“The costs of overhauling a network, which could span hundreds of thousands of kilometres and digitising it to allow for predictive maintenance, even for a medium-sized country, would be prohibitive, if not impossible, but first steps need to be taken,” Carvalheira indicates.

One of the solutions that has re-emerged is to allow independent power producers (IPPs) to enter the power landscape more fully, and for the government to cut away some of the red tape limiting embedded generation projects. Most recently, Ramaphosa announced an amendment to Schedule 2 of the Electricity Regulation Act to increase the Nersa licensing threshold for embedded generation projects from 1MW to 100MW.



Key approaches

However, just investing in new power plants or adding conventional capacity to the grid is not a panacea. Rather, there are some key approaches that can offer viable solutions to the energy security challenges.

Carvalho notes: “An IPP programme enables governments to focus on distribution and transmission, while simultaneously broadening the potential for opportunities and diversifying investments. As well, making it easier for IPPs to invest in power generation has knock-on socioeconomic effects, such as generating jobs and much needed employment, both directly and indirectly.”

“Furthermore, leveraging business data and analytics for intelligent decisioning can greatly assist and support governments and utilities at macro and microeconomic levels on improving their planning, investments, maintenance and service delivery,” says Carvalho.

Cross-channel approach

By implementing a cross-channel approach throughout the business – from maintenance, installations, and support to billing, collections and marketing – and following a data and analytics-driven approach to business and customer management, bodes the opportunity to create a single, central intelligent decisioning platform. This will involve moving beyond simplistic approaches based on applying various sets of business rules at a departmental level, and will require investment in more advanced analytics, including artificial intelligence (AI) and machine learning techniques, as well as traditional statistical methods.

“However, the potential business gains from intelligent decisioning are far reaching; from achieving a bird’s eye view of business assets and performance to analysis of key customer attributes – such as environmental sensitivity, geographic location, customer lifetime value and risk or propensity to churn. And in turn, this can go a long way to addressing key challenges faced by governments and utilities alike, making the power-generation business more stable and enabling them to plan for the future more efficiently,” concludes Carvalho.

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