Regulatory convergence offers solution to SAPP's power shortages and ageing transmission

Executive summary

- The SAPP market faces two significant challenges – power shortages and ageing infrastructure, which causes significant losses during transmission.
- The 17 regional energy projects identified by the Southern African Development Community (SADC) to accelerate the development of new power sources suffer from a large differential between available funds and actual project delivery cost. SADC has asked member countries to identify key factors behind this gap.
- There is a lack of capacity to wheel power to mines in the Zambia and Democratic Republic of Congo (DRC) Copperbelt region and Zimbabwe's central transmission corridor is now severely aged and needs a complete overhaul.
- Overall, the region needs around $1.8bn to fund the strengthening of the high-voltage transmission lines and the development of specific interconnector projects, but there are major barriers to investment in the region's ageing transmission infrastructure.
- Many of these problems could be resolved via the introduction of more effective and more harmonized regulatory structures, removing arbitrary differences in the investment environments of neighboring electricity supply industries (ESIs).

A blueprint for energy trading in Africa

The Southern African Power Pool (SAPP) is the most developed electricity trading platform in Africa – until now it has been more advanced than either the Eastern African Power Pool or the Western African Power Pool, although both these pools are now catching up fast.

Because of its longevity and its established market operations, SAPP provides both a blueprint for the establishment of any electricity trading platform in Africa and a benchmark which other power pools may try to exceed.

Historically, the strength of the SAPP has been anchored on the Southern African Development Community (SADC) Energy Protocol of 1996 which was formulated to promote the common development of national energy policies and matters of common interest for the balanced and equitable development of the energy sector throughout the region.

The 1996 SADC Energy Protocol has been important in that all energy reforms that individual countries have embarked on have been reflective of the collective goals of the 12 member states of SAPP. The SAPP market has been key in coordinating planning and operation of the electric power system among member utilities.

Unlike most regional groupings in Africa, SADC was specifically formed to promote regional integration within Southern Africa and that is the path SAPP followed by integrating utilities to provide a forum for regional solutions to electric energy problems and spearhead future developments.

SAPP benefitted from the advancement in the South African electricity sector. Eskom significantly helped to shape the region's electricity development and the formation of the SAPP trading market.

Currently, SAPP has developed the most sophisticated and advanced electricity market in Africa that offers different platforms such as the day-ahead market, the forward physical market and the intra-day market.

To overcome inter-country challenges that are sometimes embedded in different policies, regulations and rules, SAPP has developed its own trading rules which regulates

power trading. In that way, no two countries can draft or set bilateral trading rules to govern their agreements outside the SAPP framework.

So, within SADC, bilateral trading agreements for power are allowed but they must be strictly governed by the trading rules set within the SAPP market regulations and they must fully abide by those rules.

Regional soft infrastructure alignment

Apart from adhering to the policies and regulations, all state power utilities and independent power utilities that want to participate in the SAPP market are expected to align their systems to the SAPP rules. Their soft infrastructures must be consistent with the SAPP system. And in that way, there is total integration of the various country systems.

The only exceptions have been Malawi and Angola. Despite being SAPP members, the electricity grids of Malawi and Angola have for decades been isolated from the regional power trading system because the two countries did not have direct connection to the SAPP central corridor. However, the 218km, 400kV Mozambique-Malawi (Moma) interconnector is expected to be commissioned in mid-2026, and the 166km, 400kV Angola-Namibia (ANNA) power interconnector is expected to be commissioned in 2029.

Power shortages and ageing transmission

As a market, the SAPP faces two significant challenges – power shortages and ageing infrastructure, which causes significant losses during transmission. In 2024 and 2025, the region suffered from the El Niño climate event that caused a severe drought in Southern Africa, severely debilitating sources of hydroelectric generation. Except South Africa and Mozambique, the whole southern region currently is in power deficit, with Zambia and Zimbabwe the worst affected.

To accelerate the development of new power sources, SADC has identified 17 energy projects in the region, including DRC, through a program dubbed SAPP Program for Accelerated Regional Energy Projects (SAPP-AREP). It is funded by the World Bank with resources provided by the International Development Association (IDA) and Multi-Donor Trust Fund (MDTF).

The program aims to provide technical assistance and support to enhance countries' capacity and effectiveness in addressing infrastructure requirements. Within SADC, the cost of projects can vary significantly. In some cases, same size projects could have as much as an 80% differential in terms of the actual delivery cost.

To deal with this, SADC wants member countries to identify key factors behind this gap in project development costs. This is especially important as some countries are struggling to raise financing due to high levels of indebtedness. This will also help financiers interested in investing in more than one country.

A major part of the resolution to this problem could come from the introduction of more effective and more harmonized regulatory structures, removing arbitrary differences in the investment environments of neighboring electricity supply industries (ESIs).

Regulatory convergence is also expected to help overcome the major barriers to investment in the region's ageing transmission infrastructure. Lack of transmission capacity makes it impossible to wheel all the power needed to meet growing demand by the mines in Zambia and the Democratic Republic of Congo (DRC).

One of the biggest challenges is that Zimbabwe's central transmission corridor is now severely aged and needs a complete overhaul. For instance, during the period in which Zambia and DRC increased dependency on South Africa's Eskom and EDM of Mozambique, this corridor – the main crossroads of regional power exchange – experienced frequent capacity overloads and outages. This affected power transmission to mines in Zambia and DRC despite upfront payments by off-takers.

The Zimbabwe-Zambia interconnection is also subject to limitations and lacks sufficient capacity to cope with the projected increase in demand, especially from extractives. Zambia's internal transmission network is also old and requires upgrading. State power utility ZESCO is working on bolstering the Zambian central corridor and at the same time doubling its transmission capacity to match with growing demand.

Overall, the region needs around $1.8bn to fund the strengthening of the high-voltage transmission lines and the development of specific interconnector projects. Even the most advanced jurisdictions like South Africa are also grappling with ageing transmission

infrastructure that also triggers loss of energy during transmission. The power transmission losses are as high as 4% in some of the SADC countries.

As part of the process of harmonizing transmission systems, SAPP is also in the process of standardizing all high-voltage interconnectors to 400kV. Most countries outside South Africa operate 330kV for high voltage transmission lines.

Regulatory reforms underway in many countries

Comparative ERI scores for SAPP countries						
Country Name	2018	2019	2020	2021	2022	2024
Angola	..	0.405	0.593	0.591	0.608	0.737
Botswana	..	0.449	0.336	0.451	0.527	0.682
Congo Democratic Republic	..	..	0.377	0.418	0.527	0.603
Eswatini	..	0.607	0.506	0.6	0.621	0.749
Lesotho	0.481	0.513	0.497	0.469	0.49	0.61
Malawi	0.697	0.64	0.55	0.557	0.479	0.755
Mozambique	..	0.448	0.382	0.16	0.372	0.569
Namibia	0.815	0.695	0.759	0.663	0.618	0.831
South Africa	0.638	0.581	..	0.652	0.55	0.754
Tanzania	0.75	0.738	0.721	0.669	0.675	0.823
Zambia	..	0.618	0.655	0.587	0.608	0.744
Zimbabwe	0.476	0.534	0.631	0.606	0.686	0.818

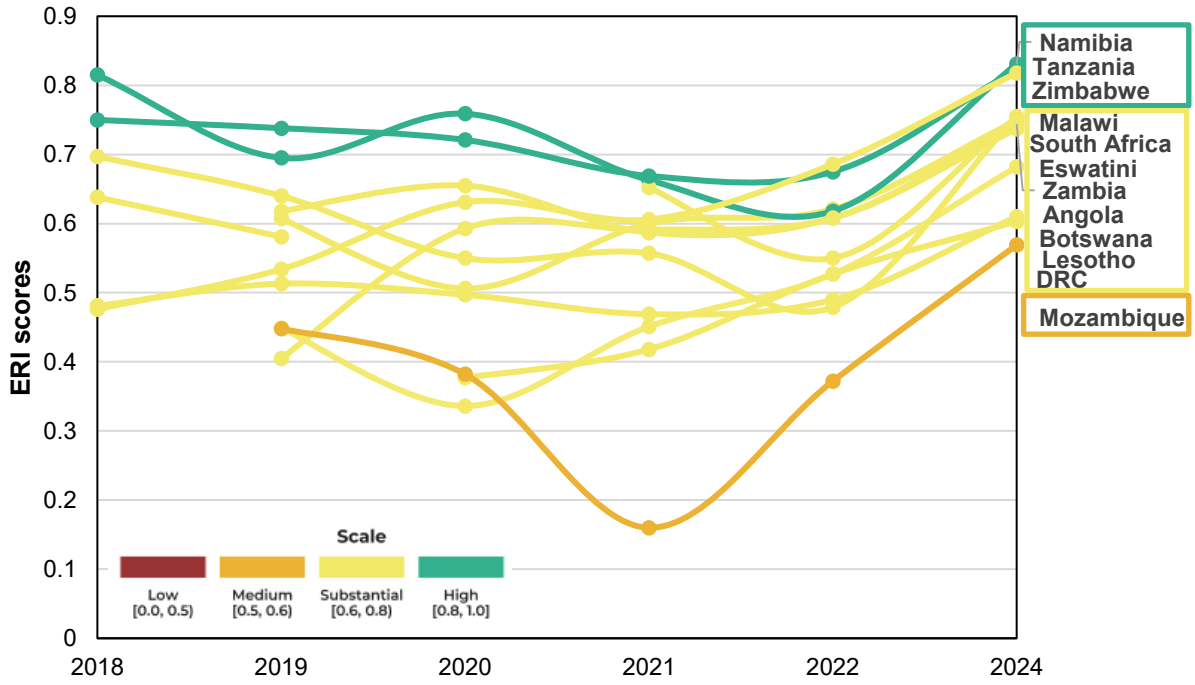
Driven by these market and sectoral needs, many SAPP member countries have been upgrading their regulatory frameworks – a trend which is reflected in the results of the latest ERI survey which shows an overall trend of improvement in all 13 respondents from the region.

In March 2025, Namibia – fourth placed in the overall index introduced a raft of regulatory reforms to improve the working of its modified single buyer market. Its Electricity Control Board (ECB) revised transmission and distribution grid codes following a review conducted by the Grid Code Advisory Committee (GCAC). This is a stakeholder representative panel with members from all areas of the electricity supply industry including generators, the system operator, transmission and distribution companies and large consumers

These codes were aligned with the connection code. A market code and sections on cybersecurity were added. ECB also updated its Wheeling Framework governing bilateral

transactions in the market and introduced an Embedded Generation Standard (EGS), setting conditions for on-site electricity generation and supply. In an important step towards regulatory convergence, the GCAC has also developed a new Connection Code aligned both with international best practices and the SADC Regional Grid Code.

Figure 1: ERI Scores in SAPP – Namibia, Tanzania and Zimbabwe in the leading cluster



Tanzania's regulator also has strong engagement with ESI stakeholders. In April 2025, its Energy and Water Utilities Regulatory Authority (EWURA) held working sessions with stakeholders to discuss reforms. It is planning to extend the tariff review cycle from three to five years and to integrate climate change impact assessments into sectoral business planning. It is also planning to conduct a cost-of-service delivery study in the 2025/26 financial year.

Tanzania, which is also a member of EAPP, was overall fifth placed in the 2024 ERI survey. Its scores in future surveys are likely to improve as additional reforms are introduced. In the coming year, the regulator plans to introduce performance-based licensing for electricity providers, who will be evaluated annually on service delivery metrics including response times, reliability and customer satisfaction.

Presenting the energy budget to parliament in April 2025, Deputy Prime Minister and Minister for Energy Dr Doto Biteko said EWURA faced significant structural hurdles

caused by limited technical capacity and bureaucratic delays. Calling for "a new era of active regulation", he said "we must grant EWURA and other authorities greater operational independence to act swiftly and professionally, without unnecessary bottlenecks."

As noted above, Zimbabwe's power sector has major investment needs which are also strategically important for the wider region. The country ranked sixth in the 2024 ERI survey. In May 2025, the Zimbabwe Energy Regulatory Authority (ZERA) launched its strategic plan. This plan sets out a series of expectations from the Ministry of Energy and Power Development. It asked ZERA to give top priority to adding wind, solar and other alternative energy sources to the generation mix. It also said it expected the regulator to work with licensees to find ways of providing power supply infrastructure to both urban and rural areas, and to reduce system losses. ZERA will also promote net metering.

Elsewhere in the region, South Africa has gone through one of the most dramatic periods of ESI reform anywhere in Africa. Following a multi-year crisis at state-utility Eskom with large-scale load-shedding the government started reshaping the entire sector in 2021 with the first major amendment of the 2006 Energy Regulation Act (ERA). This first step – raising the threshold for embedded generation projects from 1MW to 100MW was swiftly followed with the launch of an Energy Action Plan in 2022. Under the guidance of the Presidency's National Energy Crisis Committee, this set out a plan for unbundling Eskom and creating an open electricity market.

Later that year, President Cyril Ramaphosa lifted the 100MW limit on embedded projects initiating what has become the most dynamic market for the construction of private sector commercial and industrial power renewable power projects on the continent. A 2024 Electricity Regulation Amendment Act (ERAA) set up an open market platform and formally established the National Transmission Company of South Africa (NTCSA) as a transmission system operator independent of Eskom.

The ERAA gave additional powers to the National Energy Regulator of South Africa (Nersa) including the authority to act as an arbitrator between stakeholders and to approve tariffs based on supply agreements so licensees can recover their costs.

In December 2024, the government launched and Independent Transmission Project (ITP) sounding exercise and a year later electricity and energy minister Kgosientsho Ramokgopa announced that seven bidders had been prequalified by the Independent Transmission Projects Procurement Programme (ITPPP) to develop and finance new grid infrastructure. The NTCSA expects to launch the South African Wholesale Market (Sawem) in Q3 2026.

Electricity trading opportunities

Global concerns about climate and a growing demand for primary resources with a low carbon footprint have motivated much of the renewable energy investment in both South Africa and Zambia's and DRC's Copperbelt region. Power demand is coming from mining and mining-related industries. Offtakers want to take more power from the grid when available, or to wheel in power from IPPs in the country or the region, or to build their own embedded generation. In addition, to this trend – which brings with it a host of new regulatory requirements – new players including private power traders are joining the market, which is adapting further under their influence. Driven by these factors, growth in regional power demand in the next three years is estimated to be as high as 6% annually.

At the regional level, SAPP is taking an ambitious approach to ensure that planned key interconnectors are expedited. The three priority interconnectors identified include the Moma transmission interconnection backed by the World Bank where, after many delays, commissioning is expected in June, interconnecting Malawi with the SAPP.

SAPP is also supporting the development of the ANNA interconnector, as noted above, which will tie Angola into the SAPP network – and provide an important link between SAPP and CAPP.

To provide a holistic transmission corridor, SAPP wants the four project sponsors of the ZIZABONA (Zambia, Zimbabwe, Botswana and Namibia) to move to expedite its implementation after close to 20 years of technical delays. The ZIZABONA project will be the most concrete transmission line within SADC and that will also help the region holistically integrate with the EAPP through the Kenya-Tanzania-Zambia interconnector. By the time the ZIZABONA is complete, Malawi and Angola would have fully integrated

into the SAPP trading platform. While these physical connections are being built, progress must also be made on regulatory convergence to ripe the full benefits of market integration.

Case study – regulatory implementation opens greater private sector role in Zimbabwe

The government of Zimbabwe expects that its September 2025 decision to allow private operators to participate in electricity distribution and power retailing will reduce the fiscal burden on Zimbabwe Electricity Transmission and Distribution Company (ZETDC) and improve collection rates and grid stability. ZETDC will retain authority over developing the transmission network and has ambitious plans.

Third-party grid access regulations are expected to be in place by the end of the first quarter in 2026 when the authorities will start issuing secondary distribution and retail licenses.

This is not a legislative change. The necessary texts have been in place since the introduction of the 2002 Electricity Act, and the regulator has been empowered to issue licenses since 2011. But a cabinet decision has now allowed these regulatory developments to advance.

Other elements of regulatory implementation include a plan to allow ZEDTC to use bank finance to support expansion in power supply and for lending institutions to recover their costs through the billing system.

The reforms allow for greater private sector participation, for instance by using net metering to provide solar PV-generated electricity to off-grid suburbs via new distribution lines which could be connected to the ZETDC grid.