Brief Note – Southern African Power Pool

Girish Sharma

The Southern African region, home to nearly 280 million people, spans a vast geographical area and includes 15 countries that are part of the South African Development Community (SADC). The SADC, which has the highest number of middle-income countries among all African regional economic communities, was established for socio-economic, political, and security integration. However, there is a significant disparity in the development levels of its member countries. Six of these countries are landlocked, eight have populations of less than 15 million, six have economies that generate less than $10 billion annually, and several depend on transnational river basins for their water supply. Given these diverse development levels and economic conditions, enhancing access to electricity is crucial for poverty reduction and national development. This need is further amplified by the increased connections to households and businesses. Cross-border connections, which allow countries with fewer energy resources to access more reliable and cost-efficient supply from neighbouring countries, are essential. However, over the past years, inadequate power infrastructure has had a greater impact on poverty reduction and economic development in Southern Africa compared to other African regions. Therefore, addressing these challenges is a fundamental part of their national development strategies.

Rising electricity demand in Southern Africa, driven by sectors like mining and manufacturing as well as population growth and rural electrification, is paving the way for increased regional integration. However, the region's excess supply capacity has been dwindling since 2007 due to insufficient investments in new generation capacity. Africa's abundant renewable energy potential could provide affordable and secure energy, contribute to universal access to modern energy, and mitigate environmental impacts. The challenge lies in the scale of the necessary generation and transmission investments, which often cannot be justified based on national demand alone. Therefore, structuring these investments as regional projects that cater to demand from multiple countries is crucial for their economic viability. However, implementing these large and complex generation and transmission projects, some of which span multiple countries, is a significant challenge.

The Southern Africa Power Pool (SAPP), the most advanced power pool in Africa, plays a central role in Southern Africa's development agenda. Established in August 1995, the SAPP coordinates the power systems of twelve SADC countries, with nine being operating members connected to the grid that carries around 97 percent of the SAPP's energy. This regional approach to energy development centralizes decision-making and allows for more rational planning of generation and transmission investments. It also facilitates the development of regional energy resources and infrastructure, providing shared benefits among multiple countries. The existence of interconnections and a power pool in the region enables SAPP members to delay capital expenditure on new plants, significantly contributing to the development of Southern Africa's economies.

SAPP is a key player in the energy sector, boasting a diverse energy mix and a commitment to reducing its carbon footprint through increased investment in renewable energy. At present, SAPP primarily relies on thermal (coal) power, which constitutes 59% of its energy mix. The remainder is made up of hydropower (24%), solar (5%), distillate (4%), nuclear (3%), wind (3%), and other sources (2%). Despite the dominance of coal, SAPP is committed to reducing its carbon footprint and is

investing more in renewable energy. Looking ahead, the electricity demand in SAPP's 12 member countries is projected to double by 2040, representing about 40% of Africa's total electricity demand. While current plans emphasize the development of new coal, hydropower, and natural gas resources, the declining costs of wind and solar technologies present a compelling alternative as nearly half of the planned hydropower capacity is not economical.

Unlike other African power pools, the SAPP actively trades power. It introduced the Day-Ahead Market (DAM) in 2009, a competitive auction market open to independent power producers, transmitters, and distributors. South Africa drives power trade due to its large regional power needs and creditworthiness as a power off-taker. However, further integration and market competition in SAPP depends on increasing generation and transmission capacity. In 2020/21, power demand on the SAPP competitive market was lower compared to the power supply offered. This was due to restrictions imposed by SAPP member countries to manage the Covid-19 pandemic. Some members also faced power generation constraints, resulting in low offers to the competitive market during peak hours, which suppressed market volumes.

SAPP presents a compelling case for power-centric regional integration. Other regions can learn from SAPP's focus on: (i) increasing interconnectivity between countries to enhance the reliability of power supplies; (ii) the cooperative and coordinated approach in planning and operating electricity power systems, thus minimizing costs; (iii) harmonizing relationships between member utilities to facilitate cross-border electricity trading and optimize resource allocation; (iv) enforcing common regional standards of quality, measurement, and monitoring of system performance; (v) increasing power accessibility in rural communities; and (vi) implementing strategies in support of sustainable development priorities, such as the use of hydroelectric energy.