



The SAPP Pool Plan

Highlights of the 2017 Plan

The Southern African Power Pool (SAPP)

was established in August 1995 to enable members to coordinate and cooperate in the planning, development and operation of regional generation and transmission facilities for their mutual benefit. SAPP's twelve member countries represented by their respective electric power utilities:

Angola, Botswana, Democratic Republic of Congo (DRC), Lesotho, Malawi, Mozambique, Namibia, South Africa, eSwatini, Tanzania, Zambia, and Zimbabwe. However, membership also includes various independent power and transmission companies from SADC countries.

The SAPP coordinates the power systems of these twelve SADC countries. Based on the interconnections available to date, nine of the twelve countries are operating members, namely linked to the interconnected grid. The non-operating members – which are yet to construct transmission links to the regional grid – are Angola, Malawi and Tanzania. In order to fulfil its objectives and original mandate, SAPP carries out large-scale system planning for the region. To this end, the SAPP Planning Subcommittee commissioned the first SAPP Regional Generation and Transmission Expansion Plan in 2001 (2001 Pool Plan). This Pool Plan identified a detailed list of priority generation and transmission projects to accommodate for rapidly rising electricity demand in the region over the period from 2006 to 2025. In 2009, the SAPP Coordination Center commissioned a revision of the 2001 Pool Plan.

In order to provide a longer-term roadmap to regional investment decisions and, with the World Bank's support under the SAPP Program for Accelerating Regional Energy Transformational Projects (SAPP AREP Program), SAPP commissioned development of the 2017 SAPP Pool Plan (the Pool Plan). This is the first Pool Plan adopted by SADC/SAPP and represents a significant milestone for SAPP in fulfilling its original mandate of coordinat-

ing and cooperating in the planning, development and operation of regional generation and transmission facilities for the mutual benefit of the SAPP member countries. Going forward, the SAPP has committed resources to continue updating the planning assumptions in the Pool Plan to ensure the Pool Plan remains a living document, reflecting the rapidly changing regional environment. (In particular, the Pool Plan is based on 2015 planning data and therefore would need to be updated regularly as assumptions on technologies, prices, demand, economic growth and other macro-economic factors change. Moreover, the process of developing the Pool Plan highlighted some key challenges regarding existing data availability and consistency at the utility level that will need to be addressed in future plans.)

The **objective** of the SAPP Pool Plan is to “identify a core set of generation and transmission investments of regional significance that can provide adequate electricity supply to the region under different scenarios, in an efficient and economically, environmentally and socially sustainable manner and support enhanced integration and power trade in the SAPP region.”

Methodologically, the conventional approach in a regional power sector master plan is to compare a no-regional integration scenario (“**Benchmark Case**”) to a scenario where the interconnected region is considered as though it were a single country (“**Full Integration Case**”) to derive the least cost generation and transmission investment sequencing.

The Pool Plan, however, considers an unconventional third scenario, namely the Realistic Integration Case. This scenario brings in factors of importance from individual country perspectives (e.g. each country fulfilling SAPP security and reliability planning criteria). Furthermore, an important and innovative feature of the Pool Plan is the introduction of spatial mapping using a Geographic Information Systems (GIS) approach and the provision of a database of spatial and non-spatial data for use by the member states within the Rapid Impact Assessment Matrix Tool (RIAM) for Environmental and Social (E&S) Sustainability analysis.

The main highlights of the Pool Plan 2017:

- Regional integration makes a lot of economic sense in the SAPP region. Full regional integration results in **overall savings of over \$42 billion** (NPV) in investment and O&M costs. The intermediate third scenario (Realistic Integration Case) still results in **over \$37 billion savings** (over the planning period of 2040).
- Investments in transmission have a **quick and significant pay back**. The costs of the regional interconnectors are a small proportion (about 3%) of total capital costs, but the bulk of the **significant reductions in overall NPV** are realized through these interconnectors, primarily through reducing generation investment costs but also through lower operational costs. There is therefore a strong case to **prioritize regional interconnector investments**, creating opportunities for flexible responses and making an important contribution to strengthening national transmission grids.
- There is a clear case for considering domestic, national transmission grids as an integral part of **regional integration** effort as the benefits these investments bring are shared among a wider regional community. SAPP needs to consider developing a **standardized methodology** to properly reflect the regional benefit element in the national grid strengthening projects' economic rationale.
- **Share of renewables** (and, specifically, hydro) and gas generation is expected to substantially increase at the cost of coal and other thermal generation (given the latest price curves, the upcoming SAPP Pool Plan update may result in an even larger renewable share of generation capacity).
- Low electricity prices have, in the past, given the SAPP region a comparative advantage in the costs of production, particularly for energy-intensive metals and minerals. In the regional integration case, the **short-run costs** will be an important element in keeping the average prices of traded electricity low into the future.

A number of lessons have emerged from the process of formulating the SAPP Pool Plan:

- Improved and systematic *data collection and retention* within the utilities and SAPP Coordination Centre is necessary so that there are functional and updated databases that can form the start of future planning studies;
- More frequent and detailed reviews of *demand forecasts* are necessary, followed by updates of the generation expansion plans to meet the demand;
- *Methodologies used for demand forecasting* could usefully be harmonized across the region, with realistic assumptions on the key demand drivers; and
- Continuous *training of staff* is needed in areas such as demand forecasting, collection and management of data, use of GIS and other planning tools.

SAPP recommends that the Pool Plan perspectives be incorporated into national power development planning and that implementation of the priority transmission and generation projects be advanced. The Pool Plan 2017 was adopted by SADC on the Energy Ministerial Meeting in June 2018. The SADC adopted SAPP Pool Plan of 2017 as a guiding document to guide development of power generation and transmission in the Region and to develop their National Integrated Resource Plans taking into account the SAPP Pool Plan 2017.

More information can be obtained from the Executive Summary as well as the full plan which will be available on the SAPP website www.sapp.co.zw or by contacting SAPP at info@sapp.co.zw or by telephone at **+263 242 335558 /335468 /335517 /335548**