

# Joint Review of Swedish/Norwegian Support to the Southern African Power Pool and the Eastern African Power Pool

KPMG

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## JOINT REVIEW OF SWEDISH/NORWEGIAN SUPPORT TO THE SOUTHERN AFRICAN POWER POOL AND THE EASTERN AFRICAN POWER POOL

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This End of Programs Review (Review) was prepared by KPMG International Development Advisory Services (IDAS) Norway and Norconsult for the Norwegian Agency for Development Cooperation (Norad).

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This Report is the product of its authors, and responsibility for the accuracy of data included in this report rests with the authors. The findings, interpretations, and conclusions presented in this report do not necessarily reflect the views of Norad.

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## Acronyms and Abbreviations

ADAM	African Day-Ahead Market
AfDB	African Development Bank
AFD	Agence Francaise de Developpement
AREPP	Advancing Regional Energy Projects Program
AU	African Union
CC	Coordination Centre
CoM	Council of Ministers'
COMESA	Common Market for Eastern and Southern Africa
DAC	Development Advisory Committee
DAM	Day-ahead market
EAC	East African Community
EAPP	East African Power Pool
EU	European Union
EXCO	Executive committee
FPM	Forward physical monthly market
FPW	Forward physical weekly market
GS	General Secretariat (of the EAPP)
IC	Interconnection code
IGMOU	Inter-governmental memorandum of understanding
IRB	Independent Regulatory Board
IUMOU	Inter-utility memorandum of understanding
JICA	Japan International Cooperation Agency
MANCO	Management committee
MDTF	Multi-Donor Trust Fund
MTR	Mid-term review
NOK	Norwegian Kroner
OA	Operations agreement
OECD	Organisation for Economic Co-operation and Development
OTT	Operations training team
RT	Review team
SADC	Southern Africa Development Community
SAEP	Southern African Energy Programme (Power Africa-sponsored)
SAPP	Southern African Power Pool
SC	Steering committee
SEK	Swedish Kroner
Sida	Swedish International Development Agency
STEM	Short-term energy market
TC	Technical committee
USAID	United States Agency for International Development
WB	World Bank



# 1 SUMMARY

With the Phase III support to SAPP coming to an end in 2019 and the Phase II support to EAPP having come to an end in 2017 (activities ended in 2015), Norad has commissioned a joint review of Swedish/Norwegian support program, with the purpose of

- 1) assessing the relevance, effectiveness, efficiency and sustainability of the support to EAPP and SAPP, and
- 2) documenting key lessons learnt on what worked and what did not work in these development cooperation programmes.

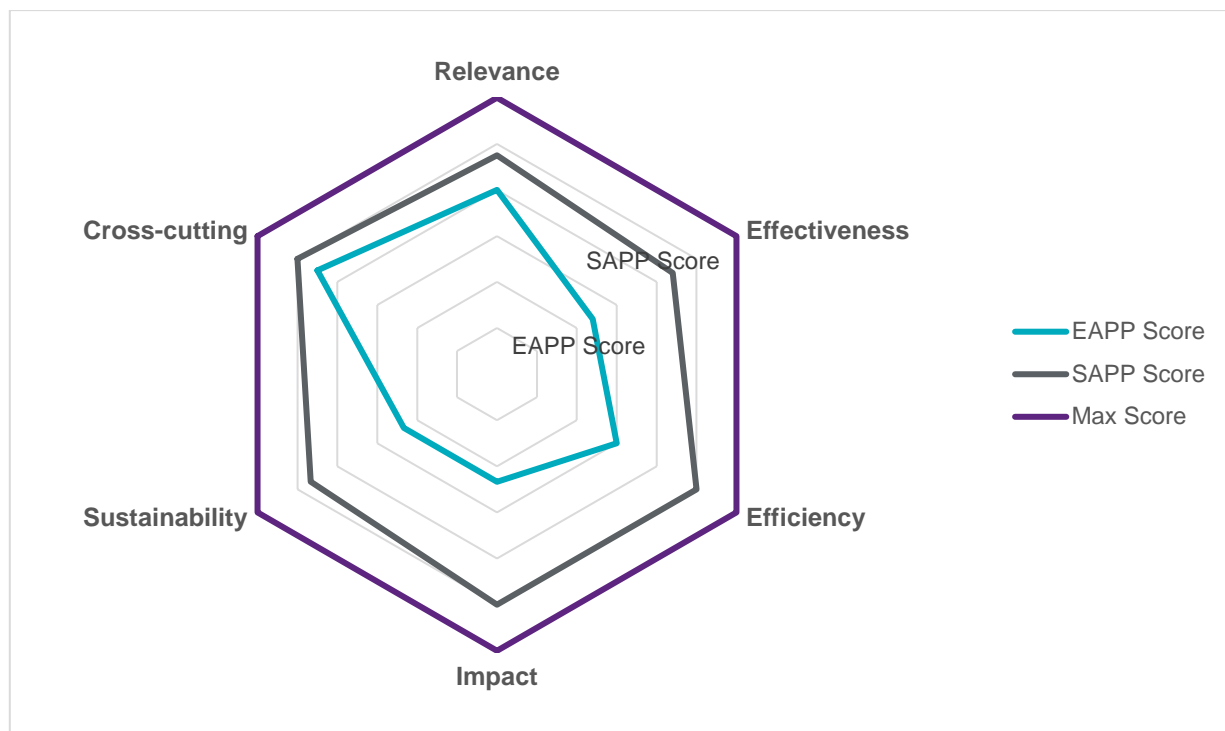
The Review is not only meant as an information document for public consumption, but also to inform the design and implementation of future development cooperation to support regional power trade.

## 1.1 Key Findings

The review evaluated the overall support program performance in terms of the OECD/DAC criteria of relevance, effectiveness, efficiency, impact, sustainability and cross-cutting issues. The support program performance, for each review criterion, was rated with a score from 1 to 6, where 6 is the best.

The overall rating of the two support programs – SAPP Phase III and EAPP Phase II – is shown in the following diagram, with a summary of the finding provided in the subsequent sub-sections:

*Figure 1: Program Review Summary*





The SAPP Support Program (Phase III) is rated satisfactory (4.8 out of 6). The program scores well across the OECD DAC criteria.

POSITIVE ASPECTS	NEGATIVE ASPECTS
<p>✓ SAPP’s trading mechanisms are one of the key success factors. There is no doubt that the success of these markets could be extended to benefit the EAPP. This will decrease market development cost and reduce implementation time for the EAPP.</p>	<p>✗ The current inadvertent energy settlement mechanism is ineffective. The method of settlement is managed on a bilateral basis, the rules of which are not always clear and consistent. The development of an efficient and transparent power balancing mechanism is required to address the shortcomings of the current approach.</p>
<p>✓ The increase in trading volumes in SAPP over the last numbers of years is testimony of the acceptance of the trading mechanisms and rules by SAPP members. Of particular importance is the fact that SAPP provides anonymous trade with guaranteed payments which removes the risk of non-payment.</p>	<p>✗ Another potential area for improvement in the SAPP revolves around the adoption and implementation of new trading rules. The reason is that a rule change usually ends up benefiting some members while disadvantaging others. The group that stands to lose will naturally resist any rule change resulting in delays, compromises and, in some instances, no rule change at all. Such delays not only hamper market progress but also impede on market efficiency. The ‘rule-conflict’ problem can also be observed in other areas of the market, for example more efficient transmission pricing arrangements and even allowing SAPP membership.</p>
<p>✓ Trading volumes in the SAPP markets are largely driven by utility traders that trade via physical markets. The SAPP markets can be made significantly more efficient by giving financial traders access to the physical markets. These traders will be able to take physical positions in the FPM, FPW and Day-Ahead markets and to balance out their positions to real time. Furthermore, the introduction of financial products will stimulate participation in the financial and physical markets driving liquidity and efficiency to even higher levels. Several of the interviewees are of the view that the development of financial products and trading mechanisms should be left to commercial financial institutions who are already engaged in developing and offering these products in other commodity markets.</p>	<p>✗ SAPP Coordination Center's (CC’s) roles and responsibilities have grown considerably. With increased levels of trade together with the expanding reach of the SAPP markets, SAPP CC’s multiple roles (as system operator, market operator, system planner, market surveillance, rule changer, risk manager, project advisory unit, etc.) can be problematic and, in some cases, could be perceived as creating conflicts of interest. Consideration should be given to clearly separating the market functions to ensure independence and fairness.</p>

The EAPP Support Program (Phase II) is rated moderately unsatisfactory (3.0 out of 6). The program scores the highest on relevance and low on the other elements: impact, sustainability, effectiveness, efficiency and cross-cutting issues.

POSITIVE ASPECTS	NEGATIVE ASPECTS
<p>✓ The EAPP program is found to be relevant to the energy challenges in the region and local and international development priorities.</p>	<p>✗ There still appears to be a lack of understanding of the role and ownership of EAPP. The political will for pushing regional integration is still weak – and without donor funding, critical EAPP meetings and activities are often cancelled or not carried out.</p>
<p>✓ Many outputs have been delivered under the program. The Twinning arrangement between EAPP and Energinet.dk for regional energy planning, market/ trading and operations development appears to have worked well.</p>	<p>✗ The program goal of initiating regional trade was too ambitious at the time. SAPP had a head start of five to ten years, but the goals of the programs were the same. EAPP was not able to leap frog because of lack of infrastructure (interconnectors) but mostly because of lack of member readiness. While EAPP's technical capacity has developed, there is a lack of visionary leadership.</p>
	<p>✗ The lack of engagement of the EAPP Secretariat with national stakeholders (utilities) and their absence from the broader energy space is a concern that needs to be addressed.</p>
<p>✓ Although EAPP is not self-sufficient, other donors such as the World Bank will continue activities such as updating the Master Plan and market development that were supported and initiated under the program.</p>	<p>✗ Trading would have been more likely if those that were readier to trade (Sudan, Ethiopia, Kenya, Uganda) would have been supported more in the program. For example, a pilot Market / Trading Sub-Committee could have been formed for a few members to pilot trade, and less emphasis could have been given to overarching issues such as regulation at this stage.</p>

### 1.2 Key Lessons

The critical prerequisites for power trade are a) existing interconnectors between countries, and b) a willingness among interconnected countries to engage in short-term power trade. Initial power trade is generally dominated by bilateral agreements between two countries and may involve third countries through which the power needs to be wheeled to reach its destination. Bilateral contracts are generally necessary to underpin investments in the transmission infrastructure.

**1.2.1 Regional Planning vs National Planning**

Key observations made regarding planning include:

- Too much time and resources are expended on technical studies as opposed to resolving the funding and project structuring solutions
- Technical studies can be kept continuously updated and current rather than restarted for each project.
- Each time a new consultant is engaged they start by redeveloping the network modelling software case files – these should be kept current and made available.

A very specific observation affecting both SAPP and EAPP is the challenge of interconnecting the two power pools, and the concomitant consequences for the Tanzanian and Zambian networks. TANESCO and ZESCO (respective national utilities) will require focussed support in this regard and further stakeholder engagement is needed to follow on from the Aurecon report.

The following hierarchy of planning is recommended:

On a national level:

1. National Integrated Energy Plan: A plan to meet all energy requirements of the country, includes electricity, liquid fuels, gas, biomass, etc.
2. Integrated Resource Plan: A long-term plan to identify electricity generation capacity requirements for the country
3. Medium Term Adequacy Assessment: Considers the electricity supply-demand balance and determines the adequacy of the system in the medium term (1-5 years)
4. Transmission Development Plan: Long-term plan focussing on the expansion and strengthening of the transmission system.

On a regional level:

1. Regional Master Plan: Considers energy sources and develops a long-term vision for the region
2. Integrated Pool Plan: Provides a long-term (20-year) outlook on capacity requirements and identifies specific projects
3. Medium Term Adequacy Assessment: Considers the electricity supply-demand balance and determines the adequacy of the system in the medium term (1-5 years)
4. Continuous network model updating, integration and sharing to ensure consistent data base.

**1.2.2 Prioritisation of Regional Power Infrastructure Investments**

Most stakeholders seem to agree that increased interconnection is an aspiration that will be of great benefit to the power pool members and the region. However, a clear commitment to develop and invest in priority regional interconnection projects is mostly lacking, with the result that such projects take a long time to be realised. Several key challenges that will need to be overcome to realise the investments in cross-border infrastructure have been identified.

Role players can support the development of infrastructure as follows:

ROLE PLAYERS	KEY SUPPORT TASKS
Regional Community Institutions	<ul style="list-style-type: none"> <li>• Ensure awareness and coordination of, as well as support for, regional power projects within COMESA, SADC, EAC, AU, NELSAP, etc</li> <li>• Ensure coordination of regional power projects</li> </ul>

ROLE PLAYERS	KEY SUPPORT TASKS
National Governments	<ul style="list-style-type: none"> <li>• Ensure their power pool members are supported and capacitated</li> <li>• Ensure that national policies, legislation and regulations support cross-border power trade</li> <li>• Allocate resources to ensure meaningful contribution to and participation in Energy Minister forums.</li> </ul>
Power Pools	<ul style="list-style-type: none"> <li>• Establish secure market trading platforms</li> <li>• Promote/push increased membership and participation in the market</li> <li>• Increase liquidity and stability in the markets</li> <li>• Support the design and application of cost-reflective pricing for all services, such as wheeling, balancing, losses, control area services, etc. to ensure members are not financially disadvantaged by supporting other members' transactions</li> <li>• Explore mechanisms where counter-party risk can be transferred/devolved to other market participants – perhaps some form of a reserve fund or insurance to protect participants and the pool in the event of default by service providers (energy transactions can be threatened by wheelers not being paid).</li> <li>• Ensure rules, policies and processes are open to new participants such as IPPs and possibly even loads.</li> <li>• Allocate some revenue to infrastructure investments, such as congestions income.</li> <li>• Enhance quality and timing of pool plans – especially timing as plans take so long that the information becomes redundant</li> <li>• Pilot Independent Power Producer participation in the market to expand market participants.</li> </ul>
Members	<ul style="list-style-type: none"> <li>• Support and accept new pricing proposals for services such as wheeling, losses, imbalance accounting, etc, where these are technically sound.</li> <li>• Place greater trade volume into the short-term markets, thus increasing liquidity, predictability and confidence in the markets.</li> <li>• Support the development of infrastructure projects – even if these have greater benefit for other members.</li> <li>• Allowing greater participation in the short-term markets by allowing IPP and even loads to participate.</li> <li>• Seriously participate in the development of pool plans and commit to implementing the identified projects and convincing government to commit as well.</li> </ul>
Regional Regulatory Bodies	<ul style="list-style-type: none"> <li>• Formalise and increase participation in pool engagements to contribute to development of new rules and policies – ensure national regulatory buy-in of power pool decisions</li> <li>• Continue and increase efforts to ensure harmonisation of policies, legislation and rules across power pool.</li> <li>• Ensure individual regulators buy in to power pool generation and transmission plans and that individual countries' regulations do not impede such plans – i.e. cross-border transmission investment should be treated similarly to domestic transmission investments.</li> <li>• Encourage the promotion of more cost reflective pricing by their members – both in terms of price level, but also in terms of structure – where appropriate allocation between fixed and variable costs allow for competition.</li> </ul>
Development Partners	<ul style="list-style-type: none"> <li>• Coordinate development partner programs and interventions to avoid overlaps, duplication and conflicts. Wider consultation before finalisation of scope of work for projects</li> </ul>

ROLE PLAYERS	KEY SUPPORT TASKS
	<ul style="list-style-type: none"> <li>• Coordination of development partners through a joint support programme spearheaded by a lead partner (rather than individual development partners all engaging directly with support recipients)</li> <li>• Clear specification of purpose, targets and outcomes envisaged for support programs</li> <li>• Support of power pools and regional regulatory bodies with capacity building and funding specific initiatives (eg studies and tools)</li> <li>• Support to power pool members to identify regional projects and to fund project preparatory and development costs to financial close – with specific focus on supporting the business case</li> <li>• Provide investment/debt funding to close the gap for projects which fall short of full economic justification but are important regional assets</li> <li>• Consider donor-funded guarantee mechanisms or 'default fund' and grant funds to bring investment projects to financial close</li> <li>• To recognise that transmission projects could attract favourable (or soft) funding.</li> <li>• Support power pools and members to coordinate fund raising to achieve specific goals.</li> </ul>

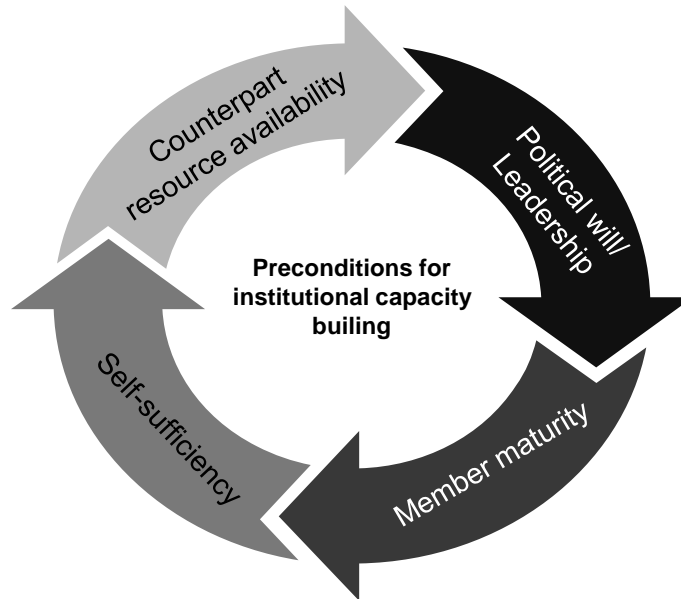
Regarding the SAPP and EAPP governance structures, it is recommended that a critical review of the numerous roles of SAPP and EAPP – which sometimes are in conflict – should be undertaken, and roles allocated to other organisations where appropriate. This could, for example, include appointing banks or other financial institutions to do market risk management, financial settlement and security management. Also, oversight and surveillance cannot be undertaken by the power pool alone and there needs to be greater independent oversight to protect the interest of all the market participants.

Further, SAPP and EAPP have no specific authority over members and besides reporting up to the Energy Minister’s meetings there appears little ongoing political support and commitment. This area may need to be strengthened – both in terms of ensuring more decision-making autonomy by the power pools and enhancing political support – to ensure increased coordination and commitment to cost-effective power infrastructure investments.

A regional investment vehicle such as the “trans-border investment body” in the West African Power Pool could be considered to fast-track the development of regional power projects.

**1.2.3 Institutional Capacity Building**

For capacity building to be effective, certain pre-conditions that need to be in place or addressed by a capacity program have emerged from the Review, as shown in the following figure.



There is a lot of potential for cross-pool sharing of knowledge, experience and systems. Although EAPP was not able during the program to leap-frog and gain from the SAPP experience (which had a 5-10 year head-start), EAPP can learn a lot from SAPP and operational and trading synergies can be improved. This can be done through staff exchanges and lessons learning, and potentially through a shared trading system. Although EAPP's trading platform is sufficient to start trading today, EAPP could use SAPP's platform in the future, as there is no need to acquire or develop a new, more sophisticated platform. Now that SAPP's trading volume is picking up, it is also an important demonstration example to EAPP member state decision-makers.

**1.2.4** Timing and Purpose of Power Trading Mechanisms

Some important lessons regarding the timing of power trading mechanisms, based on experiences in SAPP and EAPP, are listed below.

SEQUENTIAL STEPS	DESCRIPTION
Early Shadow Trading to Build Capacity and Confidence	<ul style="list-style-type: none"> <li>• The EAPP Twinning arrangement has built some confidence in short-term power trade through shadow trading on existing interconnectors. While the nominal capacity of these interconnectors is fully committed in bilateral contracts, fluctuations in supply and demand during the day still enabled short-term trades.</li> <li>• A simple excel-based trading platform provided daily trading practice over a 6-month period. Significantly, the commercial gain achieved by the shadow trading amounted to 20 MUSD over the 6-month period.</li> <li>• The shadow trading experience was certainly a beneficial exercise for the nascent power pool and the member utilities that participated, and can be replicated in similar circumstances to expose members to short-term trading before going live. It is, however, important that such an initiative progresses timeously to live trading to realise real benefit.</li> <li>• .</li> </ul>
Transition from Shadow Trade	<ul style="list-style-type: none"> <li>• EAPP has not achieved the transition from shadow trade to live short-term trade, with the main obstacles being:</li> </ul>



SEQUENTIAL STEPS	DESCRIPTION
to Live Short-Term Trade	<ul style="list-style-type: none"> <li>○ A lack of understanding and political will at decision maker level;</li> <li>○ A lack of spare capacity on the interconnectors for short-term trade – despite the shadow trading having demonstrated that this is still possible and beneficial without dedicated spare capacity)</li> <li>○ The lack of a proper trading platform and financial settlement mechanism – despite the ADAM platform being adequate for live trading</li> <li>○ The absence of formal short-term trading agreements between the utilities</li> <li>○ Lack of a SCADA system in EAPP to manage the trades.</li> <li>● The RT has recommended to EAPP-General Secretariat to push forward with implementing live trade on these small interconnectors so that the utilities and the Secretariat have experience and confidence to take on larger trades immediately once new interconnectors like Ethiopia-Kenya, Kenya-Tanzania and Zambia-Tanzania are commissioned.</li> <li>● Entering into formal short-term trading agreements (using the ADAM platform), establishing a financial settlement mechanism and acquiring a SCADA system for EAPP are relatively small obstacles to overcome and should be actioned immediately. Funding can possibly be sourced from development partners under existing support programs.</li> </ul>
Increase in Trading Volumes and Market Participation	<ul style="list-style-type: none"> <li>● Experience in SAPP has shown that short-term trade volumes increase rapidly once member utilities gain confidence in the trading mechanism, provided that there is spare capacity on the interconnectors. Key to this is the guaranteed settlement once a trade has taken place.</li> <li>● SAPP has recently amended its order of priority given to various transactions when granting wheeling rights, prioritising the allocating of transmission capacity to market transactions before such capacity is consumed by non-firm bilateral agreements.</li> </ul>
Progressing EAPP Development by Adopting SAPP Experience	<ul style="list-style-type: none"> <li>● With SAPP being more advanced in its development than EAPP it is highly recommended that the two power pools cooperate closely for EAPP to progress more rapidly without having to go through the same extensive learning curve as SAPP.</li> <li>● Some of the shortcuts that EAPP may consider include               <ul style="list-style-type: none"> <li>○ Adoption of the SAPP market platform and trading mechanisms, instead of developing or adopting a parallel platform and trading mechanisms</li> <li>○ Adoption of the SAPP financial settlement mechanism</li> <li>○ Exchange visits (and/or temporary secondments) of key EAPP staff and operators to selected SAPP members that are active in trading</li> <li>○ Adoption of SAPP Market rules and systems to avoid duplicate systems when the two networks are interconnected.</li> </ul> </li> </ul>
Market Diversification	<ul style="list-style-type: none"> <li>● SAPP has seen a steady progression from bilateral trading only to the Day-Ahead Market and more recently the Forward Physical and Intra-Day Markets.</li> <li>● The final physical market offering will be the Balancing and Ancillary Services Market/s which ensure members who remain out of balance fairly and accurately compensate other members who support their systems in real time.</li> <li>● In addition to physical markets the opportunity for financial markets exists. Financial contracts offer greater flexibility, more efficient dispatch and payment certainty if traded through the SAPP markets. There is already keen interest in this service from private sector companies.</li> </ul>



**1.2.5 Gender and Environmental Issues**

There were no reported negative effects on gender equality during the Review as a result of the programs. In terms of staffing, both EAPP and SAPP could employ more women. Female representation at senior SAPP level is for instance non-existent. This is probably a reflection of its membership as well.

EAPP and SAPP could potentially contribute to bettering the life of women and gender equality through provision of energy that is cost efficient, healthy and good for the environment, but those potential downstream benefits are still not realized, nor have they been studied and documented.

SAPP completed an update of its Environmental and Social Management Framework (ESMF) during 2018. It is expected that this document will serve as a reference for the development of large priority electricity projects in the region. It is further anticipated that it will result in improved environmental and social requirements and that it will streamline application and approval of projects.

It is worth noting that the development of the ESMF is a good example of how SAPP structures can be used to facilitate cooperation between various countries and institutions.

**1.3 Key Recommendations**

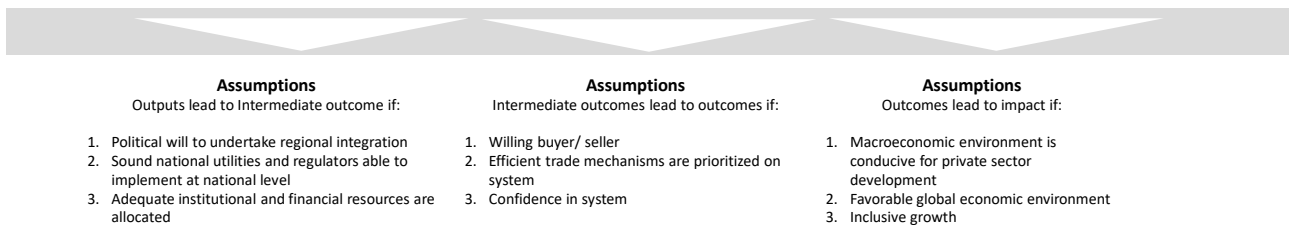
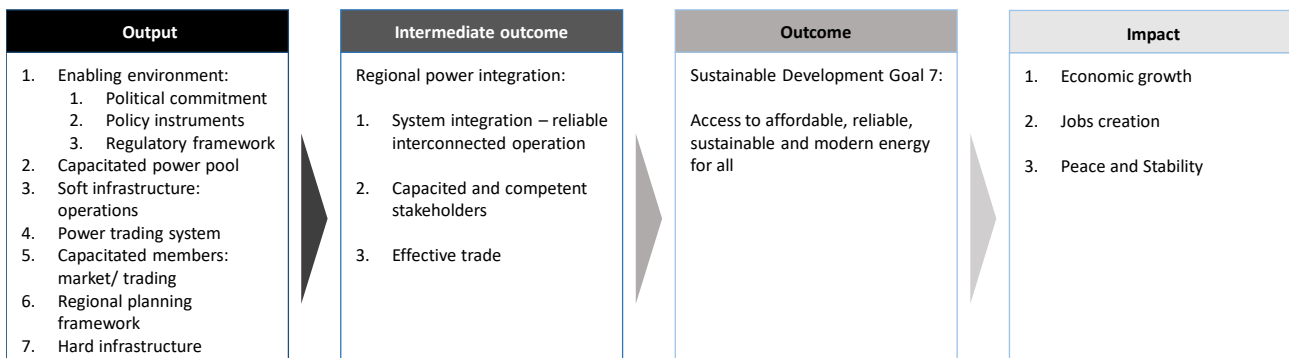
The main recommendations that emanated from the Review, for the key role players, are as follows:

ROLE PLAYER	KEY RECOMMENDATIONS
Regional Community Institutions	<ul style="list-style-type: none"> <li>To (continue to) proactively encourage debate about regional power projects by, for example, facilitating and funding suitable forums to do so and encouraging key decision makers to participate.</li> <li>To facilitate and fund regular meetings of the EAPP Technical Committees.</li> </ul>
National Governments	<ul style="list-style-type: none"> <li>To consider at national level the benefits of regional power projects will enhance the broader understanding of the opportunities of regional power trade that may bring significant economic benefits to the region, individual countries and end users.</li> <li>To have regional power projects as an agenda item when debating national power supply issues in parliament and other forums.</li> <li>National energy policies should always incorporate a regional perspective to power supply issues, so that legislation and regulations are obliged to support cross-border power trade where relevant.</li> <li>To mandate their power utilities and energy regulators to actively engage in power pool matters and ensure that requisite budgets are available to do so.</li> </ul>
SAPP	<ul style="list-style-type: none"> <li>To expand membership to IPPs, large power users and financial investors.</li> <li>To introduce financial market mechanisms.</li> <li>To review the numerous roles of SAPP with the aim to avoid (or at least minimise) conflicting situations and allocating or sharing some roles (such as risk management, financial settlement, security management) to/with other institutions that are better suited to deal with these responsibilities.</li> <li>To empower SAPP with more decision-making autonomy regarding the realisation of priority regional power projects (some lessons in this regard may be drawn from the West African Power Pool).</li> </ul>
EAPP	<ul style="list-style-type: none"> <li>To exploit the SAPP experience and immediately implement measures that will enable commencement of live trading on the existing interconnectors (Sudan-Ethiopia and Uganda-Kenya), which include</li> </ul>

ROLE PLAYER	KEY RECOMMENDATIONS
	<ul style="list-style-type: none"> <li>○ entering into formal short-term trading agreements between the parties,</li> <li>○ implement a settlement mechanism – preferably the same one as is used in SAPP (which the authors understand has meanwhile been agreed by the two power pools),</li> <li>○ acquiring and implementing a SCADA system.</li> <li>● To commence live trading as soon as these measures are in place. This will develop valuable experience and build confidence among members, in preparation for larger volume trades on future interconnectors.</li> <li>● To adopt (and possibly adapt) the SAPP trading platform for EAPP. Since the two power pools will be interconnected it does not make sense for EAPP to acquire or develop a separate platform.</li> <li>● To establish the Market Committee as soon as possible.</li> <li>● To ensure that Technical Committees meet on a regular basis.</li> <li>● Similar to SAPP, to review the EAPP governance structure and outsource certain roles that may create conflicts with other core roles. The structure of the EAPP Secretariat should be reviewed, with a view to enhancing the sustainability of the EAPP.</li> <li>● To implement a more transparent system of staff recruitment.</li> <li>● To empower EAPP with more decision-making autonomy regarding the realisation of priority regional power projects (some lessons in this regard may be drawn from the West African Power Pool).</li> </ul>
National Power Utilities	<ul style="list-style-type: none"> <li>● To establish and capacitate utility trading departments that are mandated to engage in trading in the power pool (this relates primarily to EAPP members as SAPP members are already well advanced in this area).</li> <li>● To mandate and support their staff to participate in power pool Technical Committees.</li> <li>● To include and consider key regional power projects in national power system planning.</li> <li>● To pro-actively engage with potential trading partners with a view to achieve more economical power supply.</li> </ul>
Development Partners	<ul style="list-style-type: none"> <li>● To coordinate support from development partners through forums like the Multi-Donor Trust Fund.</li> <li>● To focus on areas that further support and enhance the positive SAPP trading experience, such as <ul style="list-style-type: none"> <li>○ Opening the market to additional players (IPPs, financial traders),</li> <li>○ Introducing financial markets.</li> </ul> </li> <li>● To focus on areas that enable EAPP to commence trading as soon as possible, such as <ul style="list-style-type: none"> <li>○ Facilitating formal short-term trading agreements between the trading parties,</li> <li>○ Implementing a settlement mechanism that can be used in conjunction with the ADAM trading platform</li> <li>○ Acquisition and implementation of a SCADA system.</li> </ul> </li> <li>● To enable EAPP Technical Committees to meet on a regular basis.</li> <li>● To facilitate the adoption by EAPP of the SAPP trading platform.</li> </ul>

### 1.4 Theory of Change

The Review Team’s recommendations for development partners to continue supporting regional power trade, based on lessons learned, are expressed through a Theory of Change (ToC). A ToC describes the causal logic of how and why a program would deliver its intended outcomes and produce change. It is therefore not just important to understand required activities and interventions, but also underlying assumptions and preconditions that are needed for achieving desired results. This is especially true of complex regional integration projects where the scope of an intervention program has to be limited and focused.



## 2 INTRODUCTION

Norad has commissioned a joint review of Swedish/Norwegian support to the Southern African Power Pool (SAPP) and the East African Power Pool (EAPP), with the purpose of:

- 3) Assessing the relevance, effectiveness, efficiency and sustainability of the support to EAPP and SAPP, and
- 4) Documenting key lessons learnt on what worked and what did not work in these development cooperation programmes.

The Review is not only meant as an information document for public consumption, but also to inform the design and implementation of future development cooperation to support regional power trade.

Norad formally appointed the KPMG-Norconsult Review Team (RT) on 25 September 2018 and facilitated the introductions with both power pools and other stakeholders. In undertaking the review, the RT interviewed stakeholders in person as well as telephonically and consulted background documentation as listed in the Addendum. The RT’s findings also draw on the team members’ own observations and experiences.

This report documents, for each power pool, the main results and achievements of the support program (in Chapters 5 and 6 respectively). It further assesses the results and achievements in terms of OECD/DAC standard review/evaluation criteria (Chapter 7) and documents the key lessons that can be learnt from the experiences (Chapter 8). The last chapter provides recommendations on future donor support to regional power trade.

### 2.1 The Swedish/Norwegian Support Programs

Norway has supported the SAPP in three phases since 2003, with Sweden co-financing phases 2 and 3. The total amount of support is more than 100 million NOK.

Similarly, Norway has supported the EAPP in two phases since 2009, with Sweden co-financing the second phase. The total amount of support exceeds 29 million NOK.

*Table 1: Overview of Swedish and Norwegian Support to SAPP and EAPP*

<b>PROGRAM</b>	<b>PHASE</b>	<b>NORWAY [MNOK]</b>	<b>SWEDEN [MSEK]</b>
Southern Africa Power Pool (SAPP): Support on infrastructure planning and establishment of a competitive market	I (2003-2008)	35.44	-
	II (2008-2012)	22.50	12.00
	III (2012-2015)	18.25	20.00
	<b>Total</b>	<b>76.19</b>	<b>32.00</b>
<b>PROGRAM</b>	<b>PHASE</b>	<b>NORWAY [MNOK]</b>	<b>SWEDEN [MNOK]</b>
East African Power Pool (EAPP): Capacity building to operationalise the Coordination Centre and the Independent Regulatory Body	I (2009-2012)	12.08	-
	II (2012-2014)	12.03	5.52
	<b>Total</b>	<b>24.11</b>	<b>5.52</b>

Both cooperation agreements have been provided no-cost extensions. The cooperation with SAPP is still ongoing and will be closed in 2019. The cooperation agreement with EAPP has been completed and the programme was formally closed in July 2017 (all operational activities already ended in 2015 after the twinning activity was successfully completed).

2.1.1 Summary Results Framework

The Terms of Reference for this review summarised the results framework for Phase III of the support to SAPP and Phase II of the support to EAPP as follows:

Table 2: Results Framework

SAPP PHASE III SUPPORT	EAPP PHASE II SUPPORT
<b>INPUTS</b>	
<ul style="list-style-type: none"> <li>• Technical assistance and consultancy services</li> <li>• Software</li> </ul> <p>SAPP to provide:</p> <ul style="list-style-type: none"> <li>• Project management and logistics</li> <li>• Office space</li> <li>• Other required facilities</li> </ul>	<ul style="list-style-type: none"> <li>• Technical assistance and consultancy services</li> <li>• Software</li> <li>• Funds to recruit personnel</li> <li>• Training (local and overseas)</li> <li>• Computers</li> <li>• Communication costs</li> <li>• Stakeholder meetings</li> </ul>
<b>OUTPUTS / COMPONENTS</b>	
<ul style="list-style-type: none"> <li>• Implementation of priority regional generation and transmission projects</li> <li>• Transparent rules for access to transmission facilities</li> <li>• Working, clear and transparent transmission pricing strategy</li> <li>• More players</li> <li>• Increased trade volumes</li> <li>• Working Balancing and Ancillary Markets</li> </ul>	<ul style="list-style-type: none"> <li>• Institutional development and capacity building</li> <li>• Strengthened planning capacity and updated Master Plan</li> <li>• Regional power market development</li> <li>• Development of procedures, guidelines and system operation tools for interconnected operation</li> </ul> <p>(Referred to as “components” in the final completion report)</p>
<b>INDICATORS</b>	
<ul style="list-style-type: none"> <li>• Increased DAM share (5% by end 2015)</li> <li>• Increased participants in DAM (at least 10 by 2015)</li> <li>• DAM system revenues generated adequate (at least 100% of DAM costs)</li> </ul>	<ul style="list-style-type: none"> <li>• Satisfaction of customers and stakeholders</li> <li>• Existence of EAPP staffed, equipped and operating organs for system operation coordination, market coordination and regulation</li> <li>• Number of countries and extent of tangible measures taken to harmonize with Regional Grid Code, and close gaps in regulation</li> <li>• Existence of effectively operating Sub-Committees created for techno-commercial operation, planning and regulation</li> <li>• Approved and implemented EAPP organizational structure</li> </ul>

SAPP PHASE III SUPPORT	EAPP PHASE II SUPPORT
GOAL AND PURPOSE	
<p><u>Goal</u> Least-cost environmentally-friendly affordable energy and increased accessibility in the region</p> <p><u>Purpose</u> Implement an efficient regional spot market</p>	<p><u>Goal</u> To provide efficient and effective market operation and system operation coordination and regulatory services for the regional power market</p> <p><u>Purpose</u></p> <ul style="list-style-type: none"> <li>Operationalize the General Secretariat and Independent Regulatory Board</li> <li>Operationalize the regional grid code</li> <li>Create and operationalize working groups for regulation, planning and operation of the regional power system</li> <li>Implement and build on the management consultancy inputs</li> </ul>

## 2.2 Key Objectives

The key objectives of the most recent support phases to SAPP and EAPP, as outlined in the Terms of Reference for this review, are as follows:

Table 3: Key Support Objectives

SAPP PHASE III SUPPORT	EAPP PHASE II SUPPORT
Implement an efficient regional spot market, with the development goal of least-cost environmentally-friendly affordable energy and accessibility in Southern Africa, both through the development of the regulatory environment (grid codes, trading regimes etc) and the physical infrastructure, particularly the construction of inter-national transmission lines	Provide system operation coordination regulatory service for the regional power market

## 2.3 Multi-Donor Trust Fund

These institutional cooperation programmes with SAPP and EAPP has been complemented by:

- Capacity building and technical assistance from other development partners, including AfDB, AFD, EU, JICA, USAID (through Power Africa) and WB,
- Support for the planning of physical infrastructure for power trade and energy generation.

In addition to these bilateral support programs, a larger fund for coordinated support from donors has been set up 2015 under the Advancing Regional Energy Projects Program (AREPP), with the World Bank as the main contributor and Sweden a secondary contributor. The intent of the AREPP is to continue the Norwegian/Swedish bilateral assistance and is thus somewhat overlapping in scope and content. The program builds in East Africa on a Road Map and a Master Plan, and in Southern Africa on an agreed expansion program.

## 3 BACKGROUND

### 3.1 SAPP

The SAPP was created in August 1995 at the SADC summit when member governments (excluding Mauritius) signed an Inter-Governmental Memorandum of Understanding for the formation of an electricity power pool in the region. SAPP's mission is to provide the least cost, environmentally friendly and affordable energy and increase accessibility to rural communities.

SAPP has the vision to:

- Facilitate the development of a competitive electricity market in the SADC region.
- Give the end user a choice of electricity supplier.
- Ensure that the southern African region is the region of choice for investment by energy intensive users.
- Ensure sustainable energy developments through sound economic, environmental and social practices.

The SAPP has two main types of membership:

- Operating members – those interconnected on the power system
  - National Utilities:
    - BPC (Botswana); EDM (Mozambique); Eskom (South Africa); LEC (Lesotho); NamPower (Namibia); SEC (Eswatini); SNEL (DRC); ZESA (Zimbabwe), ZESCO (Zambia)
  - Independent Players:
    - HCB (Mozambique); Motraco (Mozambique); CEC (Zambia); Lunsemfwa (Zambia); Ndola Energy (Zambia)
- Non-operating members – those not interconnected on the power system
  - National Utilities:
    - ESCOM (Malawi); RNT (Angola); Tanesco (Tanzania)

The SAPP is accountable to the SADC Directorate of Infrastructure and Services with an EXCO (typically Chief Executive level of members), MANCO (Senior Executives) and the Coordination Centre which employs a number of specialists. The SAPP membership is also represented on four sub-committees for Markets, Planning, Operations and Environment. These sub-committees form working groups as required to address any specific detailed matters.

The ministers responsible for energy in the SADC region signed the Revised Inter-Governmental Memorandum of Understanding on 23 February 2006.

The SAPP is governed by five agreements:

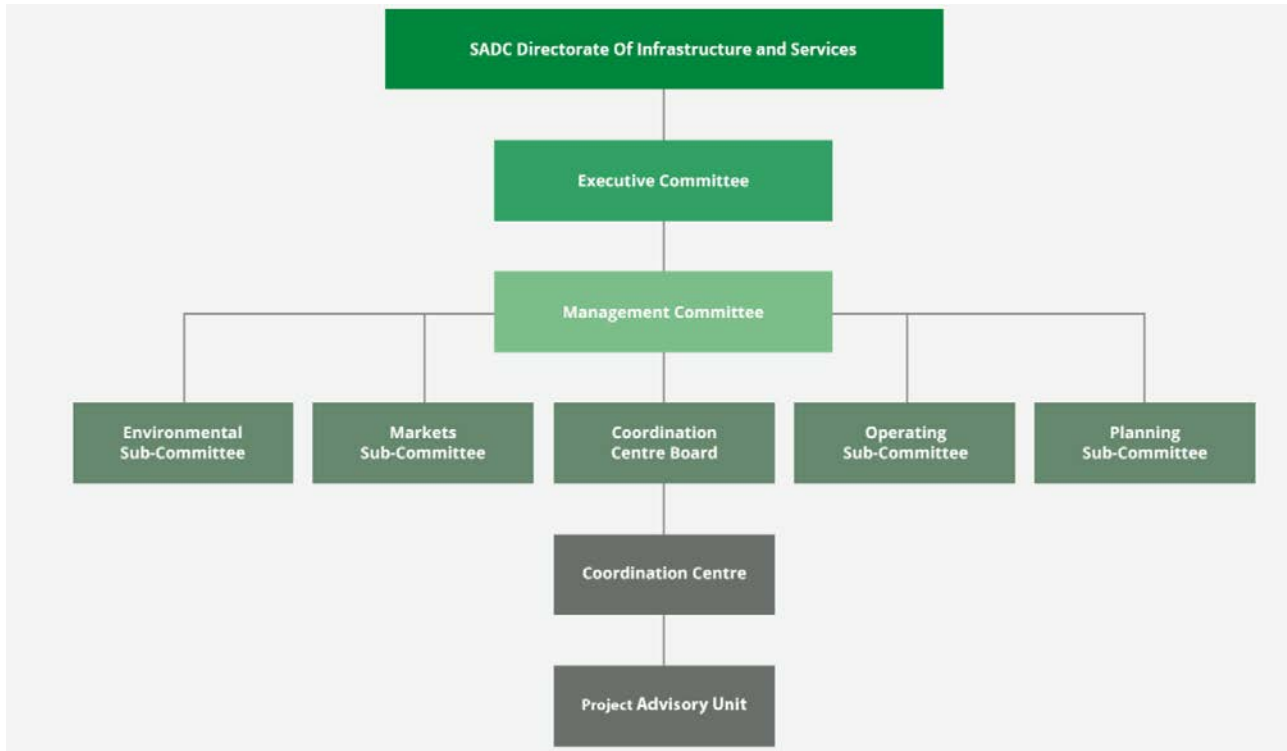
- The Inter-Governmental Memorandum of Understanding
- The Inter-Utility Memorandum of Understanding
- Agreement Between Operating Members
- Operating Guidelines
- SAPP CC Constitution

There are also Market Guidelines and other documents providing rules, such as the “trading book of rules”.



The current SAPP structure is as follows:

Figure 2: SAPP Organogram



### 3.2 EAPP

EAPP was established in 2005 with the signing of an Inter-Governmental Memorandum of Understanding by seven East African countries, and an Inter-Utility Memorandum of Understanding by nine utilities from those seven countries. Since 2005, another three countries and five utilities have joined the EAPP.

The EAPP has two main types of membership:

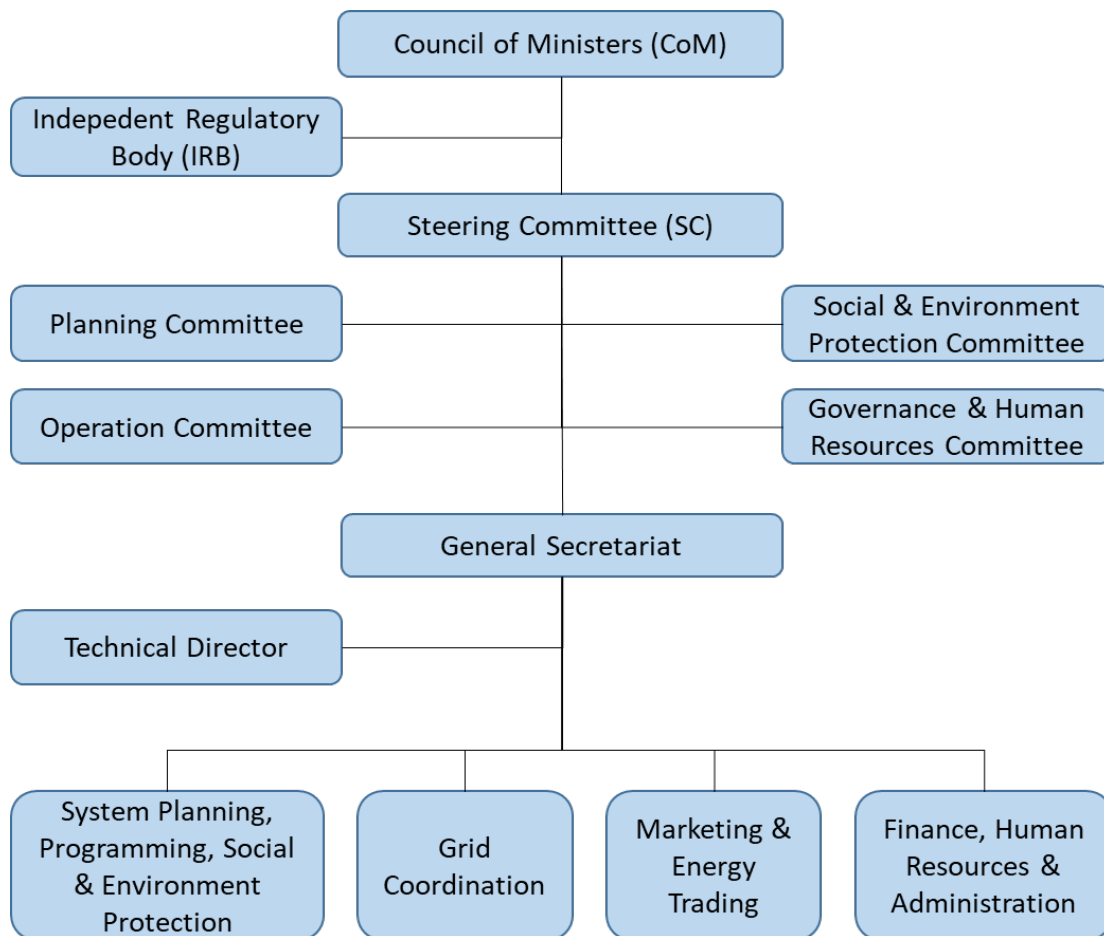
- Active members – national utilities (generation, transmission and distribution companies) with full membership status and voting rights
  - National vertically integrated utilities:
    - EEHC (Egypt), EEPCo (Ethiopia); EWSA (Rwanda); GECOL (Libya); REGIDESO (Burundi); SINELAC (Burundi/DRC, Rwanda); SNEL (DRC); TANESCO (Tanzania)
  - National generation companies:
    - KenGen (Kenya); NEC (Sudan)
  - National transmission companies:
    - KETRACO (Kenya); SETCO (Sudan); UETCL (Uganda)
  - National distribution companies
    - KPLC (Kenya)
- Affiliate members – IPPs that fulfil the membership criteria but do not have voting rights
  - IPPs:
    - None at this stage

EAPP has a mandate to coordinate cross-border power trade and grid interconnection among East African nations. In November 2006, the Common Market for Eastern and Southern Africa (“COMESA”) adopted EAPP as its *specialized institution for electric power*.

The EAPP headquarters (including the General Secretariat, and Independent Regulatory Board) are presently located in Addis Ababa, Ethiopia.

The original organizational structure of EAPP, as revised in 2014, is shown in the following figure:

Figure 3: EAPP Organogram



The **Council of Ministers (“CoM”)** is the EAPP’s supreme governing and decision-making body. It is constituted of the Ministers responsible for electricity from the countries that have signed the IGMOU. The COM’s primary role is to provide strategic guidance and oversight to the Steering Committee, while its mandate is to resolve major policy issues and admit new members to the EAPP.

The **Steering Committee (“SC”)** acts as the board of directors of the EAPP, reporting directly to the COM. It is composed of the CEOs of those utilities that are Active Members of the EAPP by virtue of their signature of the IUMOU. The SC is the executive arm of the EAPP, responsible for policy formulation and execution.

The **Independent Regulatory Board (“IRB”)** is constituted of nominees of national energy regulators in EAPP member countries. Steered by the policy decisions of the COM and deriving its authority from the IGMOU, the IRB imposes the regional market rules and grid code upon the EAPP participants. Its role and responsibilities are documented in the EAPP Organizational Structure Manual include, amongst others: a) monitoring and surveillance of regional market development, b) enforcing adherence to the rules (standards, procedures and specifications), c) setting regulated tariffs and wheeling charges for regional transmission interconnectors, and d) arbitrating disputes related to power exchanges and transactions within EAPP.

The administration of the EAPP is overseen by the **General Secretariat (“GS”)**, which is led by a Secretary General and supported by key technical staff. The primary role of the GS is to handle the day-to-day activities of the EAPP, and to provide secretarial services to the CoM, SC and Technical Committees.

The four **Technical Committees (“TCs”)** are composed of experts from the member utilities (one expert per utility for each Committee) and chairmanship is rotated annually by country in alphabetical order.

The TCs report directly to the SC. The Planning Committee is responsible for the coordination and harmonization of power sector master plans and development programs among EAPP members. The Operation Committee is responsible for the definition of the operation and maintenance rules for power plants and networks involved in EAPP. The Social and Environment Protection Committee is responsible for the social and environmental impact assessment and mitigation measures on the electrical installations within the EAPP. The Governance and Human Resources Committee is responsible for governance and HR matters in EAPP.

EAPP is governed by four binding agreements as set out below.

- The IGMOU of 24 February 2005, which enabled the establishment of EAPP, and covers issues such as membership, member obligations, organizational structure, resources, arbitration and enforcement.
- The IUMOU of 24 February 2005, which defines the fundamental principles for the management and operation of the EAPP.
- The Operation Agreement (“OA”) between EAPP Members, which deals with operation requirements of the regional interconnected network and sets out the GS’s duties and modalities.
- The EAPP Interconnection Code (“IC”), also referred to as Regional Grid Code, which provides the rules and standards for technical planning and operation of the EAPP Interconnected Transmission System. This exists in draft form as COMESA Harmonized Standard.

## 4 APPROACH AND METHODOLOGY

An inception report documenting the agreed scope, budget, methodology and workplan for this assignment was submitted to Norad on 02 October 2018.

Stakeholder interviews were conducted over a two-and-a-half-month period between 24 September and 7 December 2018.

### 4.1 Approach

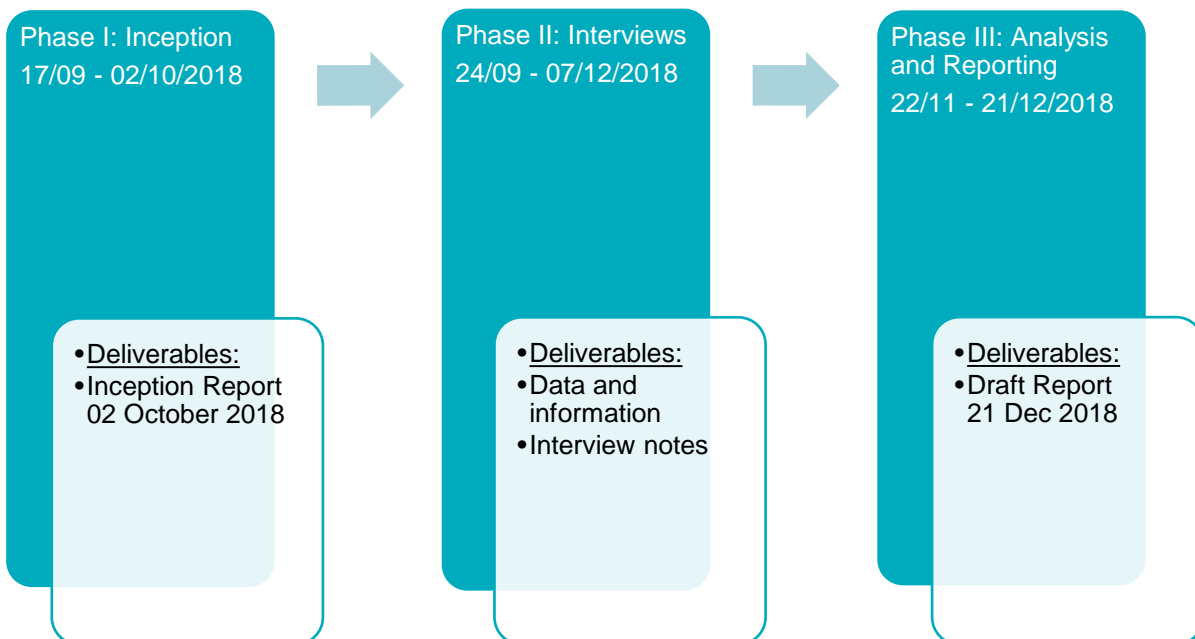
To review the Program, the OECD-DAC criteria including crosscutting issues criteria were used as the basis to organize the findings as stated in the Terms of Reference of the call:

- **Relevance:** The extent to which the completed project met the needs of the recipient partner and beneficiaries
- **Effectiveness:** The extent to which the completed project has attained its objectives
- **Efficiency:** The extent to which inputs were translated into outputs
- **Impact:** The (likelihood) extent to which the project produced positive and negative long-term changes, directly or indirectly, intended or unintended
- **Sustainability:** The probability of continued long-term benefit
- **Crosscutting issues:** The extent to which there is no negative but positive impact on women’s rights and gender equality, climate and the environment or anti-corruption.

### 4.2 Methodology

The review was carried out in three phases:

Figure 4: Phased Methodology and Deliverables



4.2.1 Data collection instruments

The Review Team primarily gathered data from:

1. Project documents: Appropriation document, agreements, program documents, annual reports, completion reports, annual review meeting notes and other relevant project outputs
2. Meetings and interviews with stakeholders and beneficiaries of support during field visits to Zimbabwe, Ethiopia, South Africa, Mozambique, Rwanda and Tanzania.

4.2.2 Rating scale

A review matrix was developed based on the Terms of Reference and the OECD DAC criteria. To make the review more reader friendly and facilitate comparison of reviews, a rating scale was used to rate the support programs for each of the review criteria.

Table 4: Program Rating Scale

GRADE	DESCRIPTION	SCORE
Highly satisfactory	No shortcomings/ Achieved 90% or exceeded targets	6
Satisfactory	Minor shortcomings/ Achieved over 70% of targets	5
Moderately satisfactory	Moderate shortcomings/ Achieved 50% of targets	4
Moderately unsatisfactory	Significant shortcomings/ Achieved less than 25% of targets	3
Unsatisfactory	Major shortcomings/ Not achieved targets	2
Highly unsatisfactory	Severe shortcomings/ Not achieved targets and caused negative impacts	1

4.3 Limitations

**This is not an evaluation but a review** to verify whether the program is on track with its implementation according to plan i.e. assess and describe the results of the Program so far and provide concrete recommendations for the remaining Program period, as well as a possible new program from 2020 onwards. The Review relies on existing documentation such as project documents, earlier reviews, annual report and interviews with Program stakeholders and beneficiaries. No additional research was performed by the Review team given the limited timeframe and resources for the assignment.

**The Review covers the entire program** but gives particular attention to SAPP member countries South Africa, Mozambique and Zimbabwe, and EAPP member countries Ethiopia, Rwanda and Tanzania, which were subject to field visits. This report does not therefore present an in-depth assessment of all aspects of the entire program.

## 5 SAPP: ASSESSMENT OF MAIN RESULTS AND ACHIEVEMENTS

The results and achievements under the Phase III support to SAPP have been assessed on the basis of overall market development, as well as agreed outputs and indicators.

### 5.1 SAPP Market Development

Perhaps the greatest success of the donor funding received by SAPP has been in the establishment, development, and operationalisation of the power trading markets.

The SAPP markets were originally established on NordPool's trading platform. The development of SAPP's own Market Trading Platform has resulted in a significant operational cost reduction and allowed the opportunity for additional markets to be added. Having its own platform could also potentially allow SAPP to operate markets for other jurisdictions – such as the EAPP. The markets have been developed through the support and skills transfer received from Norway and Sweden under Phase III of the support programme. SAPP members acknowledged and appreciated the number of experiential learning opportunities and study tours they have been provided with to ensure a solid understanding of the electricity trading landscape.

The four operational markets on the platform are:

- The Day-Ahead Market (DAM)
- The Forward Physical Market – Monthly (FPM)
- The Forward Physical Market – Weekly (FPW)
- The Intra-Day Market (IDM)

It is worth noting that the original support programme called for the development of balancing and ancillary service markets. However, the parties agreed to change the scope by introducing an Intra-Day Market instead.

At this point in the discussion it is necessary to reflect on the role of physical bilateral trades in SAPP. For many years the majority of trade between SAPP countries took place via physical bilateral trades. These transactions are between individual members and typically specify the quantity and price of electricity to be delivered over a period of time. Payment for energy delivered is also arranged between the parties. These transactions do not require the SAPP trading platforms.

The initial popularity of physical bilateral transactions is understandable given that these transactions do not require the SAPP trading platforms. However, physical bilateral transactions have a number of disadvantages including:

- Difficult, complex and time consuming to negotiate and hence not well suited for short term trades.
- Information regarding prices, volumes and duration are generally not publicly available resulting in lack of transparency which undermines market efficiency.
- Payment for energy delivered is subject to the credit worthiness of the buyer. This exposes the seller to potential late- or even non-payment issues. There are recent examples of this in SAPP.

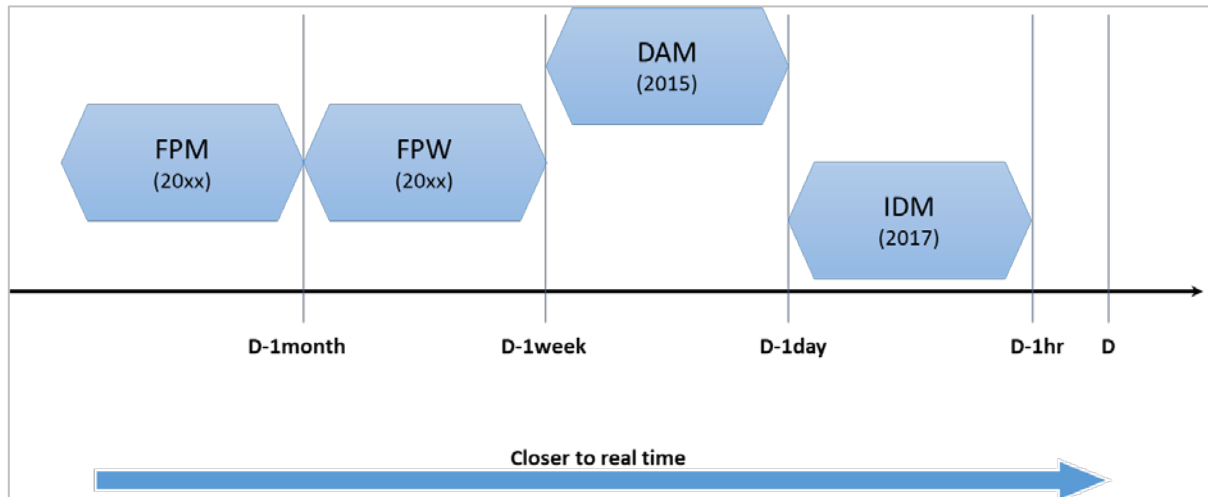
The SAPP trading platforms overcome many of these shortcomings by creating open, transparent and clear rules to facilitate trade and set prices. Payment is also guaranteed by way of security pledges by the buyers.

Although physical bilateral trades will remain an option it is expected that market participants will increasingly make use of the SAPP trading platforms as the market matures and more players are allowed in

the market. Contracts for Differences, which can be seen as bilateral financial contracts, are also expected to play a bigger role in facilitating long-term trades in the market. These contracts not only provide price certainty, but also encouraged trade through the SAPP trading platforms.

Each of the SAPP markets serve trading during a specific time period. The different markets and their time horizons are illustrated below.

Figure 5: Time Horizons of SAPP Markets



Below is a brief discussion of each market.

**5.1.1 Day-Ahead Market (DAM)**

The DAM was the first competitive market introduced in the SAPP, following the more collaboration-focussed Short-Term Energy Market (STEM) which used a 'billboard' approach for sellers to advertise their available power. The DAM, which was commissioned in January 2015 and commenced live trading on 1 April 2015, was put in place to:

- Establish an efficient & competitive marketplace, and
- Ensure that consumers benefit from a transparent market.

The key features of the DAM include:

- Provision of secure, effective, non-discriminatory and competitive trading of electricity;
- Daily conclusion of trading, for delivery the next day;
- Submission of bids (for purchases) and offers (for sales) by market participants;
- Price discovery, as the DAM is a closed market where only the market operator and respective participant know the details of the bid / offer;
- Provision of a regional reference price and history which is beneficial for new entrants, potential project developers, investors and policy makers.

Some SAPP members reported that the DAM provided them with the flexibility to balance their portfolio, with bilateral trading agreements providing for base-load requirements and the DAM providing for the variable portions of their loading. This flexibility is aided by most of the bilateral agreements not stipulating



take-or-pay commitments, thus allowing the DAM to complement the bilateral agreement without financial implications.

### 5.1.2 Forward Physical Monthly (FPM) and Forward Physical Weekly (FPW) Markets

These markets were commissioned in August 2015 and commenced live trading on 1 April 2016. They are open for members to trade monthly and weekly products, with the objective of facilitating trading of longer-term physical contracts:

- Primarily base load in the FPM - with time-of-use profiling if required, and
- Meeting the members' weekly variability in the FPW.

These markets are seen as supplementary or supportive of bilateral agreements.

The FPM is based on an auction-trading model that operates similar to the DAM.

### 5.1.3 Intra-Day Market (IDM)

The IDM was commissioned in October 2015 and commenced live trading on 1 May 2017, to provide further opportunity for members to optimise their trading position and allow some response in the event of plant failures by concluding transactions closer to real-time. This market was established as part of the Phase 3 Norad/Sida support, in place of (or as a precursor to) the balancing market.

The IDM opens for trading after the DAM closes and operates up to one-hour before real-time – it is a continuous market with trading taking place 24/7.

Key features of the IDM are as follows:

- Continuing matching of the orders submitted to the market for hourly contracts, based on a continuous trading model.
- Participants submit a Bid (sales order) or an Ask (purchase order).
- The orders are either matched automatically by the system on price or a buyer / seller can accept and "hit" an order in the market. The market contracts are settled at the matched price.
- A closing price is reported at the end of the IDM for a given hour. The closing price is the volume weighted average cost for all trades.
- IDM trades are firm contracts with physical delivery.
- Market participants will only see the open trading possibilities for their own portfolios (i.e. the system will only show the potential orders where there is available transmission capacity).
- Market participants require an agreement with the national Transmission System Operator (TSO) and a Balance Responsible Party – typically the host utility or TSO - who has the responsibility to maintain the supply-demand balance within a specific grid or area.

The IDM is hampered by practical considerations such as members' traders do not work shifts and are only available during office hours, or system operators/controllers who are trained to do trading consider IDM trades as a secondary task that does not receive ongoing attention.

There is evidence of the market participants realising the importance of the IDM and paying increasing attention to optimising their trade positions through it. It is anticipated that volumes in the IDM will increase further following the introduction of more variable renewable energy sources that include solar PV and wind. Additional players in the market will also enhance the need to adjust physical production positions closer to real time, thus increasing volumes in the IDM.

#### 5.1.4 Market Development Assessment

SAPP's relative success in promoting regional electricity trade can be traced to several factors including some political and macro-economic factors. The political climate in southern Africa changed considerably with the formation of South Africa's first democratically elected government. A spirit of cooperation and trust between countries replaced the political tensions and mistrust during the apartheid era. SAPP benefited from these positive political developments which contributed to the willingness of countries to support and rely on regional trade to address electricity shortages and surpluses.

Furthermore, during the late 1990s and early 2000s South Africa had excess electricity and saw the SAPP as a vehicle to sell its surplus energy. Utilities also identified cost-optimisation opportunities by importing electricity at a lower cost than producing it themselves. These factors all contributed to a willingness to trade.

Another important driver for regional electricity trade is the support to countries that experience electricity shortages during droughts. The SAPP has proven on several occasions that it is an efficient mechanism to facilitate energy trading between countries to minimise the negative impact of drought on economic development and poverty alleviation.

Market participants nowadays generally agree that the SAPP markets are playing an increasingly significant role in a) creating access to low cost electricity, b) increasing market efficiency through dynamic pricing signals, and c) managing trading risks through clear and transparent rules. The support from Norway and Sweden to the SAPP has greatly contributed to this and is often acknowledged as such.

The DAM contributed significantly to mitigating certain events, such as:

1. Supply shortages in South Africa (2008-2015) – while there was limited power available to support Eskom and prevent load shedding, the market did allow Eskom to trade small volumes of surplus which provided a small off-set to diesel consumption and much needed revenue during occasional windows of surplus.
2. Drought in the region (2014-2017) – Severe droughts in Zambia and Zimbabwe affected the water level of Lake Kariba, reducing generation capacity of the Kariba hydro-electric stations to below 20% of normal full production. The market allowed ZESA and ZESCO to access power to reduce the level of load shedding required.
3. BPC generator failure (September 2018) – BPC's Morupule coal-fired power station was out of service, resulting in BPC relying on imports for all its power requirements. The additional imports were in part met through their long-term bilateral agreements, but the DAM contributed significantly as well.
4. The guaranteed payment that sellers are assured provided the opportunity for sales to be made to utilities which had defaulted on payment obligations on bilateral agreements.

## 5.2 **Output 1: Implementation of Priority Regional Generation and Transmission Projects**

The SAPP has seen significant under-investment in transmission and generation infrastructure. Regarding transmission, the last north-south corridor strengthening was completed in 1995 with the Insukamini-Phokoje-Matimba 400kV interconnector between Zimbabwe, Botswana and South Africa. Since then specific dedicated assets have been constructed (Motraco 400kV system between South Africa, Swaziland and Mozambique, the Aries-Kokerboom 400kV line between South Africa and Namibia, increased interconnection between Zambia and DRC), but major transfer corridors have lagged behind.

The impact of transmission shortages is discussed elsewhere in this report. It is estimated that the DRC has potential pent-up demand of over 500MW which could be supplied by other members, but the lack of adequate transmission capacity prevents it.

Several projects have seen some level of preparatory work such as a new South Africa-Zimbabwe interconnector (ZISA), a Mozambican back-bone (STE), a Namibia-Angola interconnector (ANNA), the long pursued ZIZABONA interconnection between Zimbabwe, Zambia, Botswana and Namibia, and the Zambia-Tanzania-Kenya interconnection. Also, funding is apparently in place for a Mozambique-Malawi interconnector.

Despite the best will and significant preparatory funding being provided these interconnection projects still struggle to advance. Implementation of priority projects is considered in terms of planning, project readiness and project preparation.

It follows that surplus generation capacity is required to enable countries to trade electricity. The under-investment in generation capacity in the SAPP region is another reason why SAPP has not reached its full potential. There are many reasons for the lack of generation investments including:

- Low electricity tariffs that place significant financial pressure on utilities making it difficult for these utilities to invest in new generation infrastructure or act as a credible off-taker from IPPs. Zambia is a case in point where low tariffs have suppressed public and private sector investments in generation for many years.
- In the majority of SAPP countries, the electricity industries are dominated by national monopoly state-owned enterprises, making it hard for IPPs to enter the market. The situation is made worse when utilities that are not financially viable with poor credit-ratings are expected to act as the off-takers for electricity. Viable projects would benefit from market restructuring that allows developers to sell directly to large customers and export power. Namibia is taking significant steps in this regard, with partial opening of the market expected later in 2019.
- Inadequate policies, legislation and regulations create barriers for private generators wanting to enter the market.

However, developments in recent months suggest that some of the countries are moving away from the classic monopoly model. Examples include:

- South Africa recently took a decision to unbundle Eskom into three different entities, namely generation, transmission and distribution with plans to introduce an equity partner in transmission.
- Zambia has indicated that it is considering restructuring its electricity industry to attract more private sector players.
- Namibia is on the verge of implementing a Modified Single Buyer Model which allows bilateral transactions between IPPs and large customers.

### 5.2.1 Planning

The integration between national and regional planning across SAPP has always proven problematic. Some countries do develop national plans for generation and transmission capacity while others do not. The lack of formal national planning hinders regional planning.

Regional planning is currently undertaken on a less than structured basis with infrequent/ad-hoc reports being published. The SAPP Pool Plan has recently been published and it identifies regional generation and

transmission expansion required up to 2040. It was undertaken as a once-off exercise and experienced time over-runs such that the environment had changed while it was being developed.

The SAPP members' plans generally do not materialise, with the same projects being listed year after year. The latest version of the integrated list of projects issued by the SAPP Planning Sub-Committee provides for 26 108MW to be added within the next five years – which is likely to prove extremely optimistic since most projects have not reached financial close yet.

There is a need for more consistent, integrated and improved national and regional planning in the SAPP region. A step towards this could involve capacitating SAPP to do more active and continuous energy and network planning on an integrated regional basis. The current intermittent and ad-hoc approach does not lend itself to confidence building.

Other observations regarding planning include:

- Too much time and resources are expended on technical studies as opposed to resolving the funding and project structuring solutions.
- Technical studies can be kept continuously updated and current rather than restarted for each project.
- Each time a new consultant is engaged they start by redeveloping the network modelling software case files – these should be kept current and made available.

### 5.2.2 Project Readiness

In order to track project readiness SAPP has implemented the *Project Development Readiness Assessment (PDRA)* methodology which provides a framework for reviewing the level of development of projects and for scoring the projects' readiness for implementation. SAPP members have all committed to applying this methodology, but it has not yet improved the desired accuracy of project forecasting.

### 5.2.3 Project Preparation

Another initiative to advance project preparation was the formation (with World Bank funding administered by the DBSA) of the SAPP *Project Advisory Unit (PAU)*, with a mandate to support SAPP members with project preparatory funding and access to resources and skills to achieve financial close on the identified projects. This was regarded as a significant step towards developing new infrastructure projects and investments, and although there has been significant effort in preparing generation and transmission projects in the past few years, the PAU has not created the momentum needed to complete any projects.

Although some projects are now advancing towards financial close there is concern regarding the slow implementation of regional priority interconnectors. Based on the comments received from some of the stakeholders it seems that the PAU is finding it hard to accelerate the development of new interconnectors. This is a complex issue because of the many role-players that are involved.

Rather than making the process more efficient some stakeholders have noted that the PAU has introduced another layer of bureaucracy in the already complex project governance process. Commentators have also questioned the expenditure efficiency of the PAU. While these comments are noted, the role and efficacy of the PAU has not been analysed in this report. However, it would appear that (at least in practice) there is confusion about the PAU's role, mandate and purpose. Also, indications are that the PAU's working relationships with the SAPP-CC and the various member countries may require some attention.

**5.2.4 Results Framework for Output 1**

Investment in generation and, more specifically in transmission assets has seen significant effort in the past few years with the establishment of the PAU. Despite this however transmission projects are still not progressing fast enough or reaching financial close.

The results framework for Output 1 is shown in the table below.

*Table 5: Results Framework for SAPP Output 1 - Implementation of Priority Regional Generation and Transmission Projects*

INDICATOR	ASSESSMENT	RATING SCORE (out of 6)
Priority projects identified and implemented	<ul style="list-style-type: none"> <li>• PDRA mechanism in place</li> <li>• PAU established to fast-track project preparation</li> <li>• SAPP Pool Plan compiled</li> <li>• But: No projects have reached financial close yet</li> </ul>	3 (moderately unsatisfactory)

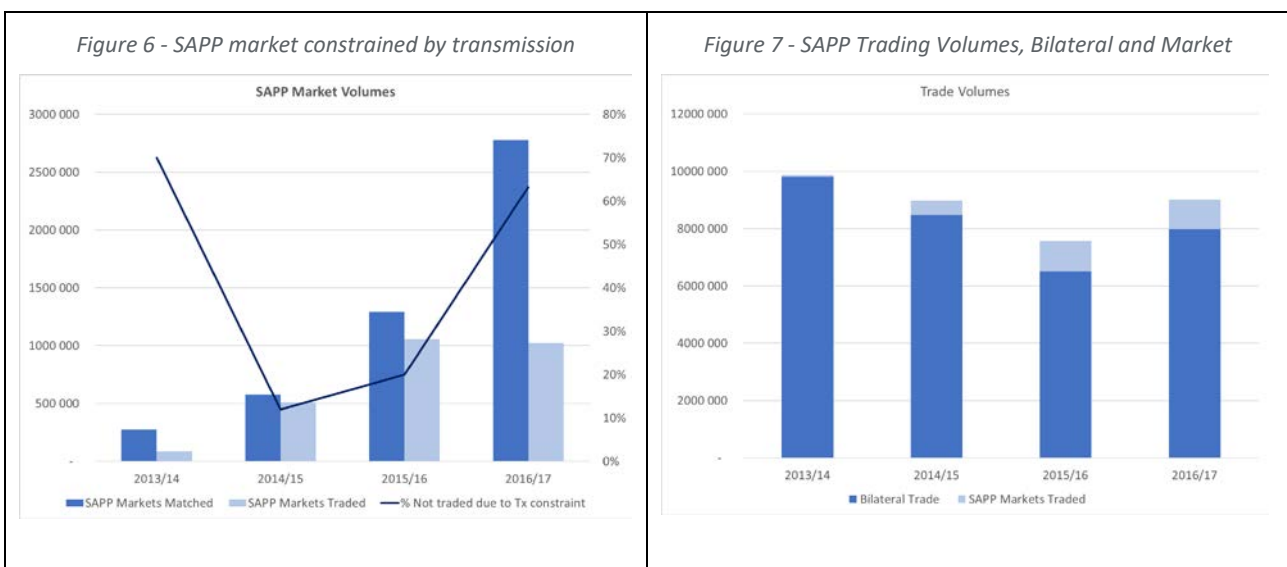
**5.3 Output 2: Transparent Rules for Access to Transmission Facilities**

**5.3.1 Transmission Access**

In previous years SAPP market trades have been constrained, reportedly because of transmission constraints.

There has been a steady increase in the appetite for short-term transactions as reflected by the volumes matched, but volumes actually traded plateaued from 2015/6 to 2016/7, despite the SAPP changing the order of priority of transactions:

- The previous order was: Firm Bilaterals → Non-Firm Bilaterals → FPM → FPW → DAM → IDM
- The new order is: Firm Bilaterals → FPM → FPW → DAM → Non-Firm Bilaterals → IDM



The reallocation of the order of granting transmission capacity has the potential to make a difference to market volumes. In the short term it appears to have driven a conversion from non-firm bilateral agreements to firm bilateral agreements. As those agreements expire (3-5 years from 2016/7), the markets will benefit in time.

SAPP should use the opportunity to encourage market participants to use bilateral financial contracts rather than bilateral physical contracts. Financial contracts offer greater flexibility, payment certainty and more efficient dispatch while achieving the same price stability outcomes. Another advantage is that all energy for financial contracts are traded through the DAM.

In addition to changing the priority rights, SAPP has undertaken several roadshows and promotional efforts to grow SAPP membership numbers. Increasing members can be achieved by allowing IPPs and possibly even customers to participate. SAPP rules and governance documents allow for this, but the detail and practical implementation is not fully in place. SAPP has formed a *Legal Working Group* to ensure SAPP documentation does not hinder new members, but more effort is required, and domestic rules applicable in each country are likely to be a barrier.

The right enabling framework – government policy, national utility support, regulator support – and rules that support and promote wider participation must be ensured

**5.3.2 Results Framework for Output 2**

SAPP and the Power Africa-sponsored Southern African Energy Programme (SAEP) initiative are in the process of developing frameworks and working on new membership criteria which could support the membership growth effort.

The results framework for Output 2 is shown in the table below.

*Table 6: Results Framework for SAPP Output 2 - Transparent Rules for Access to Transmission Facilities*

INDICATOR	ASSESSMENT	RATING SCORE (out of 6)
Increased trade volume	<ul style="list-style-type: none"> <li>• Legal Working Group constituted to ensure documentation alignment with allowing new members</li> <li>• SAPP is working on a framework to ensure membership is not inhibited</li> <li>• SAPP has amended the rules for prioritisation of trades to favour competitive market trades over non-firm bilateral trades</li> </ul>	<p style="text-align: center;">5 (satisfactory)</p>

**5.4 Output 3: Working, Clear and Transparent Transmission Pricing Strategy**

A number of efforts have been made to replace the current ‘MW-mile’ method with a zonal pricing method. The latest method received broad praise and acceptance but was never implemented due to the anticipated financial impact on certain members. Members who will pay more are reluctant to support the implementation of the new method. It is now anticipated that the new method will be at least on a trial basis in early 2019.

Fair and cost-reflective transmission usage charges have not yet been implemented. The current charges are not cost reflective and do not incentivise new investment. There is already some evidence of SAPP members wanting to impose their own transmission charges, which has the potential to harm regional relationships.

**5.4.1 Results Framework for Output 3**

The results framework for Output 3 is shown in the table below.

*Table 7: Results Framework for SAPP Output 3 - Working, Clear and Transparent Transmission Pricing Strategy*

INDICATOR	ASSESSMENT	RATING SCORE (out of 6)
Strategy and rules in place	<ul style="list-style-type: none"> <li>• Consultants were appointed and reports with recommendations were completed</li> <li>• Not yet approved for implementation</li> <li>• Expected to be implemented at least on a trial basis in January 2019.</li> </ul>	4 (moderately satisfactory)

**5.5 Output 4: More Players**

The number of participants has been stable on 9, with 8 being consistently active. Some members have two portfolios to allow for natural splits in their systems and there are ten active portfolios on the market.

Efforts to increase the number of participants through allowing IPPs is underway.

**5.5.1 Results Framework for Output 4**

The results framework for Output 4 is shown in the table below.

*Table 8: Results Framework for SAPP Output 4 - Increased Number of Market Participants*

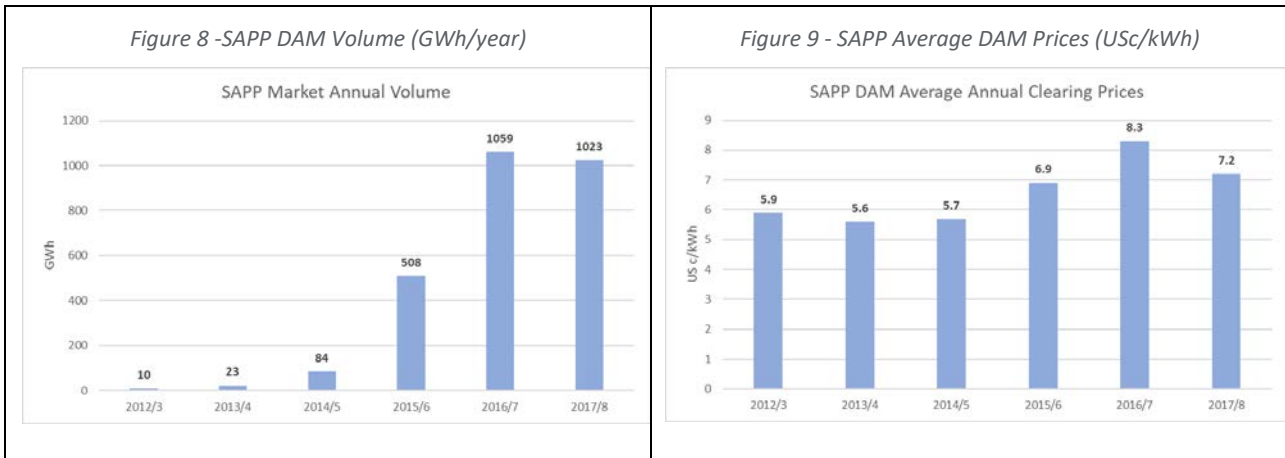
INDICATOR	ASSESSMENT	RATING SCORE (out of 6)
Increased participants in the DAM (at least 10 by 2015)	<ul style="list-style-type: none"> <li>• 9 active members</li> <li>• 10 active portfolios</li> </ul>	2 (unsatisfactory)

**5.6 Output 5: Increased Trade Volumes**

**5.6.1 Trade Volumes**

DAM volumes have shown a considerable increase over time as illustrated in Figure 8. The competitive market trading volumes (FPM, FPW, DAM and IDM) constituted 11.3% of all electricity trading in the SAPP during 2017. Indications are that this figure has increased to approximately 25% in the 2018 financial year. This is against a target of 5% set at the start of Phase III support programme.





The slight decline in trading volumes in 2017/18 should be seen in the context of the key drivers of the demand and supply balances in each country. For example, when Zambia suffered severed hydro generation production curtailment because of a persistent drought it resulted in a major increase in SAPP trades. Similarly, South Africa’s supply constraints in recent years also impacted on the volume of regional trades.

### 5.6.2 DAM Prices

During the corresponding period the DAM prices have remained consistent and reduced in 2016/7, due to surplus energy being reported by Eskom, EDM and BPC as shown in Figure 9.

The DAM prices reflect the balance between demand and supply. While low prices place pressure on sellers they do create opportunities for buyers. It is also a strong signal for generators to review their mode of operation to assess whether operating in a more flexible mode would not offer better opportunities.

Given that the purpose of introducing an electricity market is to increase access (increase volume) while improving efficiency (reduce cost of electricity), it is apparent that the DAM has been a successful market.

### 5.6.3 Market Sustainability

The table below summarises SAPP’s income and expenditure, excluding grants received and grants utilised, for the year ended 31 March 2017.

Table 9: SAPP’s Income and Expenditure for 2017 (excluding grants received and used)

DESCRIPTION	US DOLLAR
<b>Income</b>	
Member Contribution	1 429 129
Market Trading Platform – Administration fees	2 046 121
Other	(163 588)
<b>Total Income (excluding grants received)</b>	<b>3 311 662</b>
<b>Expenditure</b>	
<b>Total Expenditure (excluding grants utilised)</b>	<b>1 903 192</b>
<b>Surplus for the year (excluding grants)</b>	<b>1 408 470</b>

The above table clearly shows that SAPP is able to operate the market without any external financial support. Grant funds received are being used for specific ad-hoc projects to promote market development and priority investments.

**5.6.4 Results Framework for Output 5**

The development of the SAPP markets – especially the DAM – has been a resounding success and this success can be replicated in the EAPP.

The other markets have not seen as much success as the DAM, but there is confidence that participation levels will increase in the future.

Transmission capacity restricted the volume of energy traded on the various markets – in particular the DAM – but the reprioritising of transactions has largely addressed this until volumes increase.

The results framework for Output 5 is shown in the table below.

*Table 10: Results Framework for SAPP Output 5 - Increased Trade Volume*

INDICATOR	ASSESSMENT	RATING SCORE (out of 6)
Increased DAM share (at least 5% by end 2015)	The DAM had a market share of 11.3% in 2017	6 (highly satisfactory)
DAM system revenues generated adequate (at least 100% of DAM costs)	<ul style="list-style-type: none"> <li>DAM system revenues sufficient to meet trading system costs</li> <li>Electricity prices in the SAPP markets have reduced</li> </ul>	6 (highly satisfactory)

**5.7 Output 6: Working Balancing and Ancillary Markets**

A decision was taken to change the objective from developing a balancing market, to first developing a Day-Ahead Market. This has been fully implemented and is being used by active trading members as means to optimise trading portfolios. Traders report that they are off-setting bilateral trades where possible.

Some of the stakeholders interviewed reported that the current inadvertent energy settlement mechanism is ineffective. This mechanism relies on the three Control Areas (Eskom, ZESA and ZESCO) to settle any energy imbalances between themselves, while the other members rely on these three. The method of settlement within the three Control Areas (between the Control Area and the various members within the Control Area) is managed on a bilateral basis, the rules of which are not always clear and consistent.

There have been some efforts in establishing balancing and ancillary markets. Nordpool has combined with the SAEP to deliver some capacity building in this regard. Despite these efforts the balancing and ancillary markets are not yet in place.

**5.7.1 Results Framework for Output 6**

The results framework for Output 6 is shown in the table below.

Table 11: Results Framework for SAPP Output 6 - Working Balancing and Ancillary Market

INDICATOR	ASSESSMENT	RATING SCORE (out of 6)
Balancing and ancillary market in place	The balancing and ancillary market is not in place because the parties collectively agreed to design and implement an Intra-Day Market instead. The Intra-Day Market was successfully implemented during the programme.	6 (highly satisfactory)

## 6 EAPP: ASSESSMENT OF MAIN RESULTS AND ACHIEVEMENTS

The results and achievements under the Phase II support to EAPP have been assessed on the basis of the agreed outputs and indicators for the program. Although EAPP has reported against the original results framework for the project, there have been changes underway, and to better capture achievements and non-achievements, the RT has re-arranged and simplified the framework slightly based on the way the program was presented in the completion report with four main components: institutional development of EAPP, regional power planning, market development, and system operations development.

A key input to the program was a twinning arrangement between EAPP and Energinet.dk/Ea Energy Analysis for covering the last three components: planning, market and operations development.

### 6.1 EAPP Goal

The EAPP is presently characterised by bilateral trading arrangements between member states. As such it is in its infancy as a power pool and in the process of developing market mechanisms to enable multilateral short-term energy trading on an increasingly interconnected power system. In a market system the price of the commodity – primarily electric energy (kWh) and power capacity (MW), in this case – is determined by way of supply and demand in an open forum where participants have choice to produce and sell on the one hand, and buy and consume on the other. With increasing competition prices generally drop (as long as there is abundant supply), for the benefit of national economies as well as end users. Bilateral trading arrangements, by contrast, are generally rigid in that they lock buyers and sellers into long-term commitments that do not necessarily reflect economic realities over time. Bilateral contracts, however, provide price certainty, while market prices are prone to volatility.

The Goal of the program was to provide a) efficient and effective market operation and b) system operation coordination and regulatory services for the regional power market.

The overall finding is that the high-level objective of market trading was not achieved despite delivery of many outputs and activities. A key reason for this is lack of a political leadership within EAPP and its members.

#### 6.1.1 Results Framework for EAPP Goal

Although a trading platform had been developed and a shadow trading exercise was carried out on the existing interconnectors between Ethiopia and Sudan and Kenya and Uganda, no actual short-term trading has taken place to date as a result of the program.

The program was also supposed to build on the regulatory support given to EAPP in the Phase I support (2009-2011), but it was decided to take this component out of the program during implementation as the European Commission provided overlapping support.

The results framework for the goal as defined in the original project document is shown in the table below.

Table 12: Results Framework for EAPP Goal

INDICATOR	ASSESSMENT	RATING SCORE (out of 6)
Satisfaction of customers and stakeholders	<ul style="list-style-type: none"> <li>The project undertook a successful shadow trading exercise on existing interconnectors during the twinning arrangement, yielding short-term trades worth about 20</li> </ul>	1 (highly unsatisfactory)

INDICATOR	ASSESSMENT	RATING SCORE (out of 6)
	<p>million USD over a 6-month period. When the twinning arrangement ended, the shadow trading ceased, while it could have been transformed into actual trading that would have built confidence and experience among members and the EAPP in preparation for larger-scale trades once new interconnector infrastructure has been established.</p> <ul style="list-style-type: none"> <li>• EAPP members have not really understood (or are aware of) the opportunities and benefits of short-term trading that are achievable on existing interconnectors. It appears that members are under the impression that short-term trading is only possible once a fully interconnected system is in place.</li> <li>• EAPP was not able to leap-frog and gain from the SAPP experience during the program.</li> <li>• A practical approach and support to members that are ready is needed to demonstrate this.</li> </ul>	

## 6.2 EAPP Purposes

The program had four purposes that are assessed in the sections below.

### 6.2.1 Purpose 1: Operationalize the General Secretariat and the Independent Regulatory Board

The program sought to enhance the operationalization of the GS and IRB for the commercial operation and regulation of the Eastern Africa power market that had been established during the Phase I support from Norway (2009-2011).

In the original design of the program, the objective was to operationalize the Coordination Center (CC) that was supposed to organize system operations. At the time of the Mid-Term Review, the CC had not yet been established and its roles and function was unclear. In 2014, EAPP was restructured, and the CC was merged with the Permanent Secretariat of EAPP into the General Secretariat. The EAPP Organizational Structure Manual is in place and EAPP staff and members have been trained, but there are still considerable vacancies and work units that are not operational due to lack of internally generated funds from membership fees.

The IRB was operationalized and staffed under the Phase I program, but only one staff remains today. Its role and responsibilities are clearly defined in the EAPP Organizational Structure Manual. However, many respondents have questioned the need for the IRB in the absence of power trading between members, without which the IRB cannot be deemed to be an operational EAPP organ. The regulatory component of the program was also taken out mid-way due to overlapping funding from the European Commission.

### 6.2.2 Purpose 2: Operationalize the Regional Grid Code

A grid code typically comprises of technical specifications, rules and guidelines that aim to ensure reliable, safe, secure and economic functioning of the electric power system. The program sought to operationalize the regional grid code – an ‘Interconnection Code’ developed in 2011 that includes a planning code, connection code, interchange scheduling and balancing codes, data exchange code, metering code and

system operator training code – for the EAPP to ensure the integrity of the interconnected regional power system.

The operations component in the Twinning arrangement contributed to some degree towards the operationalization of the regional grid code, with operations training modules based on the requirements of the EAPP Interconnection Code (Code 6, Operators Training). The Interconnection Code is approved by the EAPP Steering Committee and adopted by COMESA. To fully operationalize the Code, however, continued gap analysis for member utilities and follow up is needed. Once actual trading starts, harmonization issues will also become more relevant and likely speed up this process.

### 6.2.3 Purpose 3: Create and Operationalize Working Groups for Regulation, Planning and Operation

The program sought to create and operationalize the Technical Sub-Committees and work groups to streamline regulation, techno-commercial operation and planning of the regional power system. EAPP has today four Technical Sub-Committees: a) Planning Sub-Committee, b) Operation Sub-Committee, c) Social and Environment Protection Sub-Committee, and d) Governance and Human Resource Sub-Committee. The Planning and Operation sub-committees were quite active during the program, whereas the Social and Environmental Sub-Committee only met once. The Governance and Human Resource Sub-Committee was created to restructure EAPP and ensure that its structure remains relevant to the problems faced in regional power trade.

A Market Sub-Committee for power trading has not yet been created as intended, despite the Twinning arrangement proposing its setup, role and mandate. While the EAPP understands the urgency for the establishment of the Market Sub-Committee to spearhead market activities, the reasons given by some respondents for this not having materialised included that there is currently no need for such a committee due to a lack of trading and that trading matters could so far largely be taken care of by the Operations Sub-Committee. We believe that a dedicated Market Sub-Committee, staffed by appropriate utility staff from member countries, could have greatly enhanced the progress towards physical trades on existing interconnectors over the past 3 years since the twinning arrangement ended, by having a clear focus on market operation which requires power exchanges between members to take place. The Market Sub-Committee would have been the relevant EAPP organ to ensure transformation of the successful shadow trading into a live trading exercise, using the same tools initially, and promoting the interest and experience of member utilities in real market operation.

A key challenge for EAPP is that it does not have adequate financial resources to ensure that the various sub-committees meet regularly, and since the program ended there have been very few such meetings.

### 6.2.4 Purpose 4: Implement and Build on the Management Consultancy Inputs

Phase I (2009-2011) of Norwegian support to EAPP provided training, database facilities and management consultancy services on the organizational structure and systems for the institutional development of EAPP. The intent was that the Phase II program (2012-2014) would build on those efforts to strengthen the institution. The Phase II program continued the capacity building, but the support for the IRB was ended as it overlapped with a European Commission support program. In 2014 a revised organizational structure for EAPP was approved and put in place with support of the Phase II program.

### 6.2.5 Results Framework for EAPP Purposes

The results framework for the EAPP Purposes is shown in the table below.

Table 13: Results Framework for EAPP Purposes

INDICATOR	ASSESSMENT	RATING SCORE (out of 6)
Existence of staffed, equipped and operating EAPP organs for system operation coordination, market coordination and regulation i.e. General Secretariat and Independent Regulatory Board	<ul style="list-style-type: none"> <li>• A new structure has been put in place and staff have been trained. Three out of six staff supported by Norway are still with EAPP and they appear to have a sound understanding of planning and trading issues. Due to lack of funding there are still several vacancies and some of the work units in the General Secretariat are not performing their roles and responsibilities.</li> <li>• The role and responsibilities of the IRB are documented in the EAPP Organizational Structure Manual. In the absence of power exchanges between members (i.e. trading), however, the IRB has no role to play, other than preparing for its mandate, which begs the question whether its establishment was premature. The IRB presently only has one staff member, which is appropriate under the circumstances, but inadequate for fulfilling its mandate. It is therefore not deemed to be an 'operating EAPP organ'</li> </ul>	2 (unsatisfactory)
Number of countries and extent of tangible measures taken to harmonize with Regional Grid Code, and close gaps in regulation	<ul style="list-style-type: none"> <li>• The program was only able to address grid code harmonization issues to a limited extent during the program and more effort is needed for this.</li> </ul>	2 (unsatisfactory)
Existence of effectively operating sub-committees created within the strategic period and with the financial support from Norway/ Sweden for techno-commercial planning and regulation	<ul style="list-style-type: none"> <li>• The Planning and Operations Sub-Committees were quite active during the program.</li> <li>• EAPP is not generating adequate revenue to fund the Sub-Committees on its own.</li> <li>• There is no Market Sub-Committed to take ownership and spearheading actual trading.</li> </ul>	2 (unsatisfactory)
Approved and implemented EAPP organisational structure and systems as per Norway financed management consultancy project (2009-2011)	<ul style="list-style-type: none"> <li>• EAPP has a revised organizational structure in place with clearer roles and responsibilities with a staff chart.</li> <li>• Some roles and responsibilities are not performed due to lack of funding.</li> </ul>	3 (moderately unsatisfactory)



### 6.3 EAPP Components

The program structure evolved slightly from design to implementation. The presentation of the program in four key components as used in the EAPP completion report is used in this Review to present and document achievements in a comparable way.

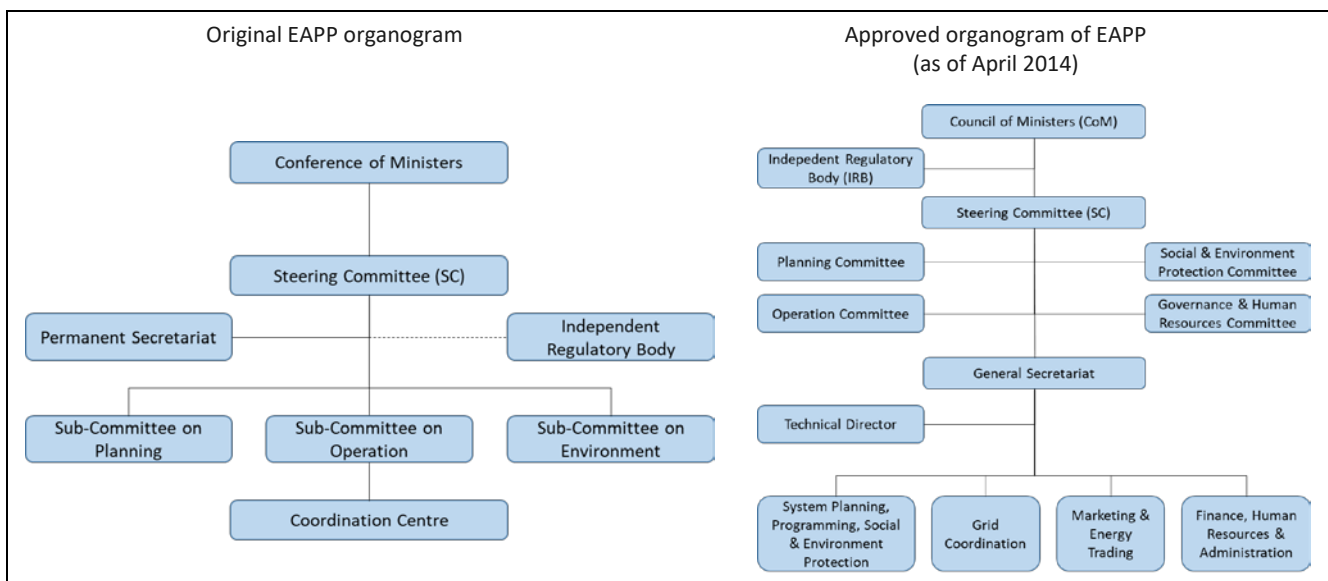
The first component, institutional development, was mainly executed by EAPP itself, whereas the three last components (planning, market development and operation) were mainly executed through the Twinning arrangement with Energinet.dk/ Ea Energy Analyses.

#### 6.3.1 Component 1: Institutional Development

The institutional development component focused on operationalizing and building the capacities of the General Secretariat, IRB and Technical Sub-Committees. This was done by providing support for staff retention/recruitment, development of procedures and guidelines, training and meetings.

The original objective was to support the Coordination Center (CC) under the original EAPP organogram, but after the restructuring in 2014, the CC was merged with the Permanent Secretariat and called the General Secretariat (GS) – see Figure 10.

Figure 10: EAPP Organizational Evolution



#### 6.3.1.1 General Secretariat (Coordination Centre)

The CC was supposed to be organised under the technical sub-committee for operation (TCO) in the initial period of the programme. However, due to delays with the operationalisation of the TCO, the establishment of the CC was also delayed. At the time of the mid-term review (MTR) in 2013, the CC was not yet established. A main observation from the MTR was the lack of clarity among the EAPP staff regarding the CC’s roles, functions, responsibilities and governance.

As of April 2014, the CC no longer exists, but is integrated in the GS, with one work unit responsible for grid coordination and another for marketing and energy trading.

The MTR recommended that the operationalisation of the CC is to be included in the Twinning consultant's scope, catering for clarification of

- The roles, functions and responsibilities of the CC;
- The resource requirements; and
- A realistic implementation plan, with transitional arrangements over the short, medium and long term, which would meet the needs of an evolving EAPP.

The Twinning arrangement did include these recommendations.

According to the available documentation and as confirmed in stakeholder interviews, EAPP staff were trained in relevant issues related to the functions of a CC, guidelines and procedures for the GS and IRB were established, and staff rules and organisational structures were put in place. Most of the trained staff has been retained – in part due to operational expenses nowadays being fully covered by member contributions (0.9 MUSD in 2017) – which is critically important for a functioning organisation. However, while the indicators for this component have largely been fulfilled the rules and procedures are not being applied (due to a lack of trading activity) and therefore their quality cannot be assessed. Further, while key staff has been capacitated and are capable of market trading, it is a mystery why the seemingly lucrative – in terms of experience and revenue – opportunity of live trading on existing interconnectors, with existing tools and experience from shadow trading, has not been pursued proactively when the Twinning arrangement came to an end in 2014. Was the EAPP leadership aware that live trading is indeed possible on the existing interconnectors (Sudan-Ethiopia and Kenya-Uganda)? In this sense, it can be argued that the CC/GS is not yet fully operational.

#### 6.3.1.2 *Independent Regulatory Board*

The IRB was established with the Norwegian support in Phase 1, covering the salaries of three staff. The support to IRB was reduced in Phase 2, and now there is only 1 staff left who is funded from member contributions. The IRB did benefit from some capacity building under the Twinning arrangement with Energinet.dk, however regulatory issues were excluded from the Twinning scope to avoid overlaps with an EC-supported capacity building programme addressing regulatory issues.

The MTR concluded that, although a draft Action Plan, Modus Operandi and IRB Working Manual had been developed, some of the roles and responsibilities of the IRB were vague and needed clarification. Furthermore, the MTR observed that there seemed to be a "disconnect" between the proposed roles, responsibilities and structure of the organisation – which befit a fully developed competitive market – and what was required in practice, namely a lean initial structure with simple regulatory and oversight responsibility that could develop into a full IRB once there was a need (i.e. once competitive trading was underway).

From stakeholder interviews in Addis Ababa in November 2018 it became clear that the operationalisation of IRB has not progressed since 2013. It has in fact receded since then, with only one staff member remaining, which is suitable for the current level of development of the EAPP.

An operation manual is in place for the IRB, but its role towards member countries and other regulators is not clear.

While the operationalisation of the IRB has not achieved the results as foreseen in the Project Document, a key lesson learned is that the goals set for the IRB were premature given the lack of market activity in the

EAPP. However, putting the framework in place has not been in vain as this forms a valuable foundation for activation of the IRB once trading commences in earnest in the EAPP.

*6.3.1.3 Technical Sub-Committees*

Support has been given to ensure the functioning of the Technical Sub-Committees as well as the Steering Committee and other meetings.

The Planning and Operation Sub-Committees have been the most active, while the Social and Environment Sub-Committee only met once. The Market Sub-Committee was never constituted as no trade took place and instead a Governance and Human Resources Sub-Committee was established to review the EAPP structure and roles and responsibilities in 2014 as those were unclear.

Unfortunately, the sub-committees and governance bodies are not meeting as they should after the program ended, due to a lack of funding.

*6.3.1.4 Results Framework for EAPP Component 1*

The results framework for the institutional development component is shown below.

*Table 14: Results Framework for EAPP Institutional Development Component*

INDICATOR	ASSESSMENT	RATING SCORE (out of 6)
Trained and experienced staff for General Secretariat and the Independent Regulatory Board	<ul style="list-style-type: none"> <li>Staff have been trained in key roles and functions through the twinning arrangement. Those in charge of planning and trade at technical level demonstrate a sound understanding of issues and opportunities.</li> <li>To which extent this was sufficient to fully operationalise the EAPP is uncertain, particularly in view of the significant time that has elapsed since the Twinning exercise ended.</li> </ul>	4 (moderately satisfactory)
Technical Sub-Committees/ Working groups approved and formally established	<ul style="list-style-type: none"> <li>Technical Sub-Committees except for the Market (trading) Sub-Committee have been established but are not meeting as regularly as they should.</li> </ul>	3 (moderately unsatisfactory)
Approved working procedures or guidelines for Sub-Committees, General Secretariat and Regulatory Board	<ul style="list-style-type: none"> <li>GS has new organizational structure with job descriptions and staff rules.</li> <li>Technical Sub-Committee by-law developed by GS and approved by Technical Sub-Committees.</li> <li>GS and IRB have signed Modus Operandi that defines administrative and communications arrangements.</li> </ul>	4 (moderately satisfactory)
Study document that identifies required Sub-Committees, justification for establishment, work plan and budget requirements	<ul style="list-style-type: none"> <li>Report on the need for, structure, and timing of the establishment of the Market Sub-Committee produced.</li> </ul>	4 (moderately satisfactory)

INDICATOR	ASSESSMENT	RATING SCORE (out of 6)
New staff rules and organizational structure approved and implemented	<ul style="list-style-type: none"> <li>• EAPP has a new structure with delineation of roles and responsibilities that was approved in 2014.</li> <li>• Job descriptions and staff rules have been developed by the Governance and Human Resource Sub-Committee, approved and implemented as of 2014.</li> <li>• A challenge is lack of revenue to cover the costs of all positions in the organizational chart for EAPP. However, EAPP has made some progress with increasing member contributions from about 0.5 MUSD in 2014 to 0.9 MUSD in 2017.</li> </ul>	<p style="text-align: center;">4 (moderately satisfactory)</p>

### 6.3.2 Component 2: Planning

The purpose of this component was to strengthen EAPP's master planning capability and update the regional master plan. This component of the program was not included originally but was added during implementation and formed part of the Twinning arrangement.

A revised Regional Master Plan was developed as a joint effort between the EAPP GS, member utilities and the Twinning consultant, with the aim of analysing the benefits of regional cooperation and making recommendations for new cross-border transmission lines. An economic and technical partial equilibrium model (using the Balmorel software) was established to simulate the power systems and least-cost dispatch options for 12 countries – Burundi, Djibouti, DRC, Egypt, Ethiopia, Kenya, Rwanda, Sudan, Tanzania, Uganda, Libya, and South Sudan – over the period 2015-2040. The Master Plan recommended six new transmission lines with a total capacity of 3,400 MW to be in place by 2020. The increased transmission capacity allows for up to 9% additional investment in hydro and geothermal power, instead of more coal, while also lowering operational expenditure by reducing fuel costs due to more efficient dispatch across countries and technologies. There appears to be uncertainty in the demand forecast, however, as the revised Regional Master Plan used national utility forecasts instead of independently estimating demand projections from a regional perspective.

According to the Twinning consultant, EAPP (represented by the Planning Sub-Committee) played an active and efficient role in the development of the revised Master Plan. To what extent member states consider the Regional Master Plan for their national planning varies. Some countries – in particular Ethiopia, Kenya and Tanzania – support the regional planning effort and use it in their national plans.

Another deliverable from the Twinning arrangement was a gap analysis between the draft planning code of the Interconnection Code and the planning principles of EAPP member countries. Due to the high-level nature of the regional planning code, the Twinning focused on practical recommendations for EAPP to establish its role as a regional power system planning organisation. The approach together with planning gap reports were presented and agreed upon by the Planning Sub-Committee members. To what extent this has been developed further is uncertain.

#### 6.3.2.1 *Results Framework for EAPP Component 2*

The results framework for the planning component is shown in the table below.

Table 15: Results Framework for EAPP Planning Component

INDICATOR	ASSESSMENT	RATING SCORE (out of 6)
Updated regional master plan and related studies developed	<ul style="list-style-type: none"> <li>The 2011 Regional Master Plan funded by AfDB was updated. Djibouti, Libya and South Sudan were included in the update. How realistic some of the assumptions, such as the demand forecast are, is uncertain, but some countries such as Ethiopia and Kenya appear to use the regional plan as an input to their in their own national plans.</li> </ul>	4 (moderately satisfactory)
Software and hardware for regional planning installed	<ul style="list-style-type: none"> <li>An opens source energy system software – Balmorel – was installed on EAPP servers so that EAPP could update the Master Plan in the future without external assistance.</li> <li>A SQL database solution for transferring Balmorel model results to MS Excel format has been installed.</li> <li>A server has been installed to run the systems.</li> <li>It is unclear whether these tools would be used in future master plan updates.</li> </ul>	3 (moderately unsatisfactory)
Relevant EAPP staff and utility staff member trained	<ul style="list-style-type: none"> <li>EAPP staff have been trained in regional planning, but it is unlikely that EAPP will be able to update the Master Plan in the future without external assistance due to lack of own resources.</li> </ul>	3 (moderately unsatisfactory)

### 6.3.3 Component 3: Market Development

The purpose of the market/trading development component of the Twinning arrangement was to update the roadmap for launching a day-ahead and short-term market, make recommendations for a market operation platform, establish a Market Sub-Committee and development of market guidelines, rules and procedures outlining governance and roles and responsibilities of the different actors.

*Box 1: Development of a Market Operation Platform for EAPP*

The Twinning Arrangement developed an MS Excel-based market operation platform that was dubbed ADAM (African Day Ahead Market), with full documentation package. The platform is able to receive hourly bids for demand and generation and to compute prices for multiple price areas based on available transmission capacity. Aggregated and detailed statistical information can be generated with hourly, daily, weekly, monthly and yearly resolution. The application has been prepared for training purposes but can also be used for actual operation. has been delivered as well.

The ADAM documentation includes the following element:

- ✓ DAY AHEAD MARKET -SYSTEM
- ✓ ADAM - DATABASE STRUCTURES
- ✓ MARKET GUIDELINES - a high-level document covering the overall guidelines for market design
- ✓ DAILY PROCEDURES - a document outlining the daily procedures for the market operator (General Secretariat), transmission system operators and power generators
- ✓ MARKET RULES - a report detailing the day-ahead market rules that govern the cross-border day-ahead market.

One of the most important elements in this component was to ensure that EAPP members gained a thorough understanding of the role of the market and the possibilities of short-term trade. A shadow trading exercise on two interconnectors – three were planned – was therefore undertaken. A market operation platform to handle the shadow-trade was developed. According to the Twinning consultant, the EAPP GS was active in the shadow trading exercise which yielded positive results and showcased the benefits of short-term trading. The EAPP has, however, not been able to lift the results from the shadow trading to the next level.

ADAM was used for shadow trading on the existing Sudan-Ethiopia and Uganda-Kenya interconnectors over a six-month period in 2014-15. The exercise yielded a 20 MUSD economic gain from the short-term trade, which is very significant given the limited capacity for trade on these two interconnectors. It is unfortunate that actual trading has not continued after the shadow trading exercise came to an end - according to the Twinning consultant, ADAM is fit for live trading and there is no need for a new market platform to start trading on existing interconnectors – since it could have brought about multiple benefits such as:

- Enhancing the interest in short-term trade of participating utilities
- Training additional staff from member utilities in Day Ahead Market trade
- Exercising live trading on the small volumes to get a real feel for the ins and outs of Day Ahead Market trade
- Developing pricing and settling mechanisms based on real data (these are areas that have not been addressed during the shadow trading)
- Refining trading skills of trained staff, to be better prepared when the larger interconnectors materialise.

The failure to continue shadow trading, and expanding it to live trading, is in part ascribed to a lack of leadership and vision in the EAPP GS and Steering Committee, while recognising that lack of operational readiness also played a role. EAPP would have been a great deal further in its development if shadow trading had continued and been transformed to live trading. In addition to development of the ADAM and the shadow trading, the Twinning delivered reports on market guidelines, day-ahead trading rules and daily procedures. These documents will be useful documents when member states start short-term trading.

The Twinning arrangement also delivered a preliminary report on the establishment of a Market Sub-Committee under EAPP. The report recommended the establishment of such a committee to drive the development of power trade in the region and emphasised the importance of having a mandate from member countries. The report also recommended that the members of the Market Sub-Committee should be recruited from higher level of management from the member state transmission system operators that have economic/ commercial/ trade background.

#### *6.3.3.1 Results Framework for EAPP Component 3*

The results framework for the regional electricity market development component is shown in the table below.



Table 16: Results Framework for EAPP Market Development Component

INDICATOR	ASSESSMENT	RATING SCORE (out of 6)
Development of a mini market operation platform	<ul style="list-style-type: none"> <li>An Excel-based mini application, named ADAM (Africa Day-Ahead-Market) was developed. According to the Twinning consultant, the model is sufficient to start live trading.</li> </ul>	5 (satisfactory)
Pilot initiation of a day-ahead market using two interconnectors	<ul style="list-style-type: none"> <li>It was decided that it would take too much time to pilot short-term trading, so instead a shadow trading exercise was carried out on the Ethiopia-Sudan and Kenya-Uganda interconnectors. The shadow trading was meant for learning and involved all activities except for actual dispatch/ flow of power and settlements.</li> <li>The shadow trading revealed that short-term trading could bring great economic gains to parties involved, even on marginal interconnectors with little spare capacity, but for some reason members do not seem to understand the trading opportunities and benefits it could bring.</li> </ul>	3 (moderately unsatisfactory)
Operationalization of market committee	<ul style="list-style-type: none"> <li>The Market Sub-Committee has not yet been established. Oversight was provided by the Operations Sub-Committee. It is assessed that a small market committee of a few members would have benefited the piloting and scale-up of trade.</li> </ul>	1 (highly unsatisfactory)
Development of market rules for day ahead market	<ul style="list-style-type: none"> <li>Basic framework documents for managing the EAPP short-term market have been developed, such as market guidelines, day-ahead trading rules and daily procedures for capacity allocation, market operations and cross-border nominations.</li> </ul>	5 (satisfactory)
Review of market development road map	<ul style="list-style-type: none"> <li>A road map discussing bottlenecks and recommendations for initializing trading was developed but not followed up.</li> </ul>	4 (moderately satisfactory)
Workshops for hands-on training	<ul style="list-style-type: none"> <li>Utility members and relevant EAPP staff were trained on basic principles and how to use ADAM. The understanding of trading opportunities and benefits appears low at policy and decision-making level and more effort is required in this regard.</li> </ul>	3 (moderately unsatisfactory)

#### 6.3.4 Component 4: Operations

The main purpose of this component was to enhance EAPP's interconnected system operation capability by establishing a team of trainers from EAPP member utilities.

According to the Twinning consultant, the capacity and willingness from the member utilities were positive. Due to lack of coordination by EAPP and the fact that Sub-Committee members did this in addition to their full-time job, progress has not been good. What was achieved is a gap study on Supervisory Control and Data Acquisition (SCADA) & Communications, as well as a system operators' training manual. The gap analysis of the EAPP operational code vs utility operational codes was not performed due to time constraints.



6.3.4.1 Results Framework for EAPP Component 4

The results framework for the operations component is shown in the table below.

Table 17: Results Framework for EAPP Operations Component

INDICATOR	ASSESSMENT	RATING SCORE (out of 6)
Gap analysis of the national SCADA and communications systems	<ul style="list-style-type: none"> <li>A SCADA and Coms report was prepared. Focus was on interconnectors that were used for shadow trade. Methodology is applicable for all interconnectors.</li> </ul>	4 (moderately satisfactory)
Establishment of Operations Trainer Team and training modules	<ul style="list-style-type: none"> <li>An Operations Trainer Team (OTT), consisting of two representatives from each member utility was established.</li> </ul>	5 (satisfactory)
System Operators Training Manual	<ul style="list-style-type: none"> <li>A manual with different training modules was developed.</li> <li>A module on market operation was added.</li> </ul>	5 (satisfactory)
Workshops for hands-on training	<ul style="list-style-type: none"> <li>Most Operations Trainer Team members went through training, but some joined the process late.</li> </ul>	4 (moderately satisfactory)

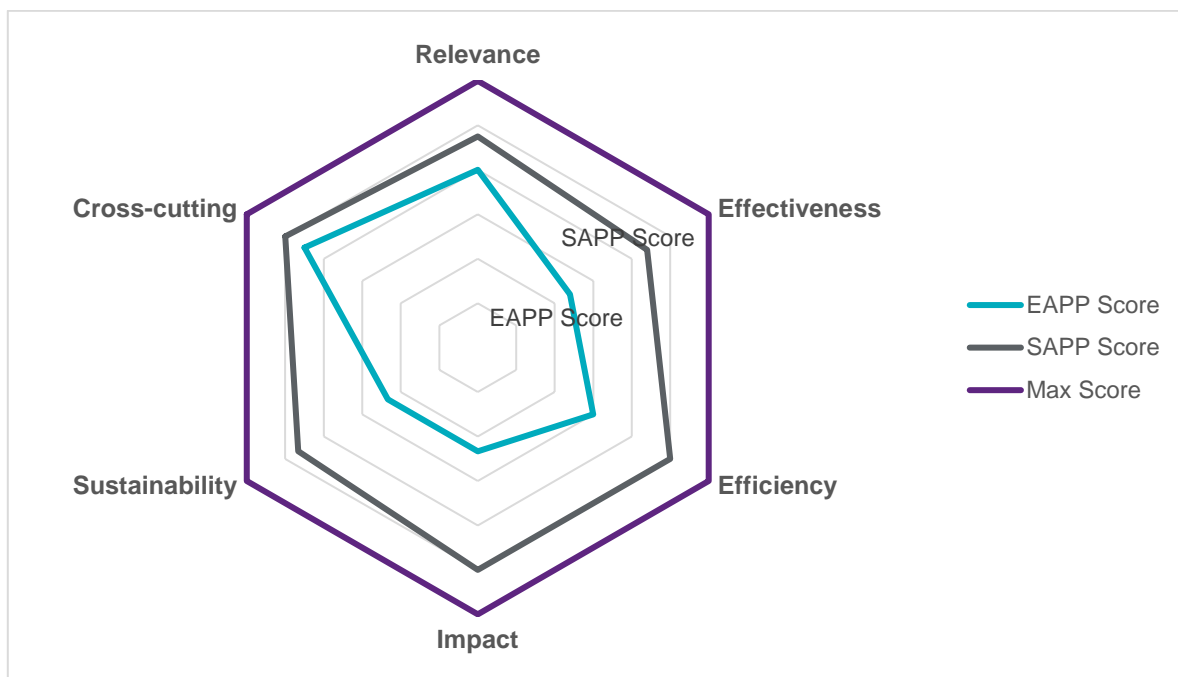
## 7 COMPARATIVE PROGRAM REVIEW

The Review evaluated the overall support program performance in terms of the OECD/DAC criteria of relevance, effectiveness, efficiency, impact, sustainability and cross-cutting issues, as required by the Terms of Reference. The support program performance, for each review criterion, was rated with a score from 1 to 6, where 6 is the best, as per Table 4 above. No weighting was applied for the overall rating i.e. all questions and criteria were given equal weight.

### 7.1 Support Program Rating

The overall rating of the two support programs - SAPP Phase III and EAPP Phase II – is shown in the following diagram, with a summary of the finding provided in the subsequent sub-sections:

Figure 11 – Support Program Rating for SAPP and EAPP



#### 7.1.1 SAPP Support Program Rating

**The SAPP Support Program (Phase III) is rated satisfactory (4.8 out of 6).** The program scores well across the OECD DAC criteria.

Table 18: SAPP Support Programme Rating

POSITIVE ASPECTS	NEGATIVE ASPECTS
<p>✓ SAPP’s trading mechanisms are one of the key success factors. There is no doubt that the success of these markets could be extended to benefit the EAPP. This will decrease market development cost and reduce implementation time for the EAPP.</p>	<p>✗ The current inadvertent energy settlement mechanism is ineffective. The method of settlement is managed on a bilateral basis, the rules of which are not always clear and consistent. The development of an efficient and transparent balancing mechanism is required to address the shortcomings of the current approach.</p>

POSITIVE ASPECTS	NEGATIVE ASPECTS
<p>✓ The increase in trading volumes in the SAPP over the last numbers of years is testimony of the acceptance of the trading mechanisms and rules by SAPP members. Of particular importance is the fact that SAPP provides anonymous trade with guaranteed payments which removes the risk of non-payment.</p>	<p>✗ Another potential area for improvement in the SAPP revolves around the adoption and implementation of new trading rules. The reason is that a rule change usually ends up benefiting some members while disadvantaging others. The group that stands to lose will naturally resist any rule change resulting in delays, compromises and, in some instances, no rule change at all. Such delays not only hamper market progress but also impede on market efficiency. The ‘rule-conflict’ problem can also be observed in other areas of the market, for example more efficient transmission pricing arrangements and even allowing SAPP membership.</p>
<p>✓ Trading volumes in the SAPP physical markets are largely driven by utility traders that trade via physical markets. The SAPP markets can be made significantly more efficient by giving financial traders access to the physical markets. These traders will be able to take physical positions in the FPM, FPW and Day-Ahead markets and to balance out their positions to real time. Furthermore, the introduction of financial products will stimulate participation in the financial and physical markets driving liquidity and efficiency to even higher levels. Several of the interviewees are of the view that the development of financial products and trading mechanisms should be left to commercial financial institutions who are already engaged in developing and offering these products in other commodity markets.</p>	<p>✗ SAPP CC’s roles and responsibilities have grown considerably. With increased levels of trade together with the expanding reach of the SAPP markets, SAPP CC’s multiple roles (as system operator, market operator, system planner, market surveillance, rule changer, risk manager, project advisory unit, etc.) can be problematic and, in some cases, could be perceived as creating conflicts of interest. Consideration should be given to clearly separating the market functions to ensure independence and fairness.</p>

**7.1.2 EAPP Support Program Rating**

**The EAPP Support Program is rated moderately unsatisfactory (3.0 out of 6).** The program scores the highest on relevance and low on the other elements: impact, sustainability, effectiveness, efficiency and cross-cutting issues.

*Table 19: EAPP Support Programme Rating*

POSITIVE ASPECTS	NEGATIVE ASPECTS
<p>✓ The EAPP program is found to be relevant to the energy challenges in the region and local and international development priorities.</p>	<p>✗ There still appears to be a lack of understanding of the role and ownership of EAPP. The political will for pushing regional integration is still weak – and without donor funding, critical</p>

POSITIVE ASPECTS	NEGATIVE ASPECTS
	EAPP meetings and activities are often cancelled or not carried out.
<p>✓ Many outputs have been delivered under the program. The Twinning arrangement between EAPP and Energinet.dk for regional energy planning, market/ trading and operations development appears to have worked well.</p>	<p>✗ The program goal of initiating regional trade was too ambitious at the time. SAPP had a head start of five to ten years, but the goals of the programs were the same. EAPP was not able to leap frog because of lack of infrastructure (interconnectors) but mostly because of lack of member readiness. While EAPP's technical capacity has developed, there is a lack of visionary leadership.</p> <p>✗ The lack of engagement of the EAPP Secretariat with national stakeholders (utilities) and their absence from the broader energy space is a concern that needs to be addressed.</p>
<p>✓ Although EAPP is not self-sufficient, other donors such as the World Bank will continue activities such as updating the Master Plan and market development that were supported and initiated under the program.</p>	<p>✗ Trading would have been more likely if those that were readier to trade (Sudan, Ethiopia, Kenya, Uganda) would have been supported more in the program. For example, a pilot Market / Trading Sub-Committee could have been formed for a few members to pilot trade, and less emphasis could have been given to overarching issues such as regulation at this stage.</p>

## 7.2 Comparative Program Review Findings

The findings of the review for each of the OECD-DAC criteria are summarised in Table 20 below. The findings are structured by strengths and weaknesses and provide a rating score for each category.

Table 20: Comparative Program Review Findings

SAPP PHASE III SUPPORT		EAPP PHASE II SUPPORT	
<b>RELEVANCE</b>			
<i>The extent to which the completed programs met the needs of recipient partners, beneficiaries and donors</i>			
<b>SCORE</b>	Satisfactory: 5.0 out of 6	<b>SCORE</b>	Moderately satisfactory: 4.3 out of 6
<b>STRENGTHS</b>	<p>All Southern African Development Community (SADC) member states have shown consistent commitment to and participation in SAPP since formation.</p> <p>Political commitment high. SAPP members (national utilities) are involved in all planning and rule processes.</p> <p>As for EAPP, the program concept is relevant to Norwegian and Swedish development priorities as this is promoting resource optimisation and regional cooperation in Africa.</p> <p>The program was well designed and realistic, and SAPP has in general made great progress - particularly in the trading environment under the program.</p>	<b>STRENGTHS</b>	<p>EAPP responds to regional integration priorities of COMESA and African Union/ New Partnership for Africa's Development (NEPAD) – and energy is a priority SDG.</p> <p>More and more EAPP countries see regional power integration in their strategic interest such as Ethiopia that has incorporated regional power integration into their national strategies.</p> <p>Member state institutions (utilities and regulators) are involved in setting priorities for EAPP, as well as regional power planning and harmonisation discussion/ processes through EAPP Conference of Ministers, Steering Committee and through technical committees.</p>
<b>WEAKNESSES</b>	<p>SAPP does not have the power to override national utility decisions in the interest of the regional economy. Although political commitment is high, political involvement is still low. Broader government and regulator participation appear less obvious and utilities operate largely autonomously in SAPP.</p> <p>There is need for greater coordination between donor organisations. Investment promotion has not yet resulted in investment in new infrastructure despite being critical to the region. There are many reasons for this including duplicate decision-making structures, conflicts of interest, insufficient understanding of project finance structures, lack of credible off-takers and weak financial status of most utilities Support for infrastructure investments needs to be reviewed and refocused to avoid duplication as well as initiatives that have a low impact or low chance of success. Donor efforts should recognise the independence of member states and that regional generation solutions can't be "forced" via regional master plans.</p>	<b>WEAKNESSES</b>	<p>There still appears to be a lack of understanding of the role and ownership of EAPP. The political will for pushing regional integration is still weak – and without donor funding, critical meetings are often cancelled.</p> <p>The program was too ambitious. SAPP had a head start of 5-10 years, but the goals were the same. EAPP was not able to leap-frog because of lack of infrastructure (interconnectors) and member readiness.</p> <p>While EAPP's development pace is assessed as being normal, there clearly is a lack of visionary leadership.</p>

SAPP PHASE III SUPPORT		EAPP PHASE II SUPPORT
<b>EFFECTIVENESS</b>		
<i>The extent to which the completed programs attained their objectives</i>		
<b>SCORE</b>	Moderately satisfactory to Satisfactory: 4.5 out of 6	Moderately unsatisfactory: 2.8 out of 6
<b>STRENGTHS</b>	<p>Increasing trade volumes and appropriate market prices are the key success factors of the SAPP. After a slow start, greater market participation was achieved through change to a more relevant trading platform and a realisation among member utilities of the benefits of the market. Utilities are well informed.</p> <p>Additional trading options laid the foundation for an efficient and well-functioning market. The payment guarantees offered via SAPP trading is an important hedge against the risk of non-payment.</p> <p>There is evidence that members can receive and benefit from the capacity building activities.</p>	<p>Many outputs have been delivered, especially under the Twinning arrangement – but outcomes have not been reached.</p> <p>The master plan seems to have informed national energy planning to some extent, but more can be done to create realistic regional-national planning cycles.</p>
<b>WEAKNESSES</b>	<p>The results framework could have benefited from better and more objective indicators and more explicit connection between funding received and specific objectives and outcomes.</p> <p>Investment promotion and development of physical infrastructure are lagging behind desired outcomes and are limiting market activities.</p> <p>The number of market participants has stayed relatively static in recent years which hampers trading efficiency. SAPP needs to broaden its participation base to include private sellers and buyers, in order to improve efficiency and extend the benefits of SAPP trading. However, the current SAPP governance and member state rules and structures makes it difficult for private market participants to gain access to the market.</p> <p>The identification of a bankable business case for new transmission investment still eludes SAPP.</p> <p>Policy makers and the public are not well informed about SAPP.</p>	<p>The results framework was not sufficient nor appropriate to track the results of the program. It is difficult to assess achievements against plan.</p> <p>Some key outputs are not used such as the market/ trading platform ADAM.</p> <p>Several factors influence the non-achievement of power trade: Lack of critical infrastructure, lack of visionary leadership, political will to undertake regional integration and understanding of trading, readiness of national utilities and regulators to implement at national level.</p> <p>The program did not effectively communicate with stakeholders/members. Few members seem to know about the shadow trading experience and the opportunities to start this today and the associated benefits it will have for members.</p>

SAPP PHASE III SUPPORT		EAPP PHASE II SUPPORT
<b>EFFICIENCY</b>		
<i>The extent to which inputs were translated into outputs</i>		
<b>SCORE</b>	Satisfactory: 4.7 out of 6	Moderately unsatisfactory: 3.0 out of 6
<b>STRENGTHS</b>	<p>The approach for design and implementation of trading platforms was very efficient.</p> <p>Resources towards trading platforms and capacity building was productively used and trading was implemented in a timely manner.</p>	<p>The Twinning arrangement approach appears to have worked well.</p> <p>Three out of six staff that were funded by the program are still at EAPP.</p> <p>Many outputs were delivered and the program stayed within budget envelope. The program was closed with a fund balance of 22% though, mainly due to some mismanagement of funds. Better results could have been delivered if those funds had been used to continue the pilot trading.</p>
<b>WEAKNESSES</b>	<p>The approach for promotion of infrastructure investments was not efficient and infrastructure investment has not materialised as anticipated. There are too many layers of decision-making and approval, which slow down the process and increase costs., with the result that proposed solutions become not only complex but also unbankable. Other reasons include: lack of role clarity resulting in multiple parties instructing consultants, governments’ drive for self-sufficiency which is often in conflict with SAPP pool plans, a conflict of interest where utilities push their own projects and agendas, insufficient understanding of project finance structures, lack of credible off-takers and weak financial status of most utilities.</p> <p>Transmission pricing in SAPP remains a problem despite several attempts to improve the situation. Apart from the technical challenges, SAPP’s governance arrangements are preventing efficient decisions because members’ interests could be in conflict with SAPP’s interests.</p>	<p>EAPP could benefit more from achievements of SAPP such as trading (platform) and future support would benefit from a review of how to create synergies and lessons learned sharing between the power pools.</p> <p>EAPP could have been more efficient in coordinating and organizing workshops.</p> <p>More funds and resources could have been allocated to making trading happen – and better results could probably have been achieved with focusing on a few members that are ready (infrastructure in place, political will) to trade rather than including everyone in the first phase.</p> <p>There was a lack of dynamism and pro-activeness in program management and governance structures that slowed down implementation. The project was decided to be closed in 2015 after the twinning activity was successfully completed and the verification procedure needed to continue disbursement to EAPP turned out to be negative.</p> <p>The program would have benefited from a more hands-on oversight from the Embassy of Norway given the level of capacity at EAPP at the time.</p> <p>Program reports do not capture to what extent EAPP is operational or effective.</p>



SAPP PHASE III SUPPORT		EAPP PHASE II SUPPORT	
<b>IMPACT</b>			
<i>The extent to which the programs produced positive and negative long-term changes, directly or indirectly, intended or unintended</i>			
<b>SCORE</b>	Satisfactory: 5.0 out of 6	<b>SCORE</b>	Unsatisfactory: 2.3 out of 6
<b>STRENGTHS</b>	<p>Trading volumes are well above target originally set by donors while electricity prices on the SAPP markets have reduced. Trading has helped countries to meet their demand during times of supply constraints (e.g. dry periods in Zambia). Also, some countries took advantage of low prices in the SAPP market to reduce their costs.</p> <p>Overall, the program is likely to serve as a catalyst for reform of the power sector in member states.</p> <p>Some learning has taken place.</p>	<b>STRENGTHS</b>	<p>The program had the potential to serve as a catalyst for encouraging reform in member state institutions, but better communication and focus on ready members was needed. (for example: Ethiopia, Kenya, Uganda, and Sudan)</p>
<b>WEAKNESSES</b>	<p>Transmission congestion is limiting access to transmission networks. Furthermore, delays in transmission investments are constraining SAPP trade.</p> <p>Members should consider to covert physical bilateral contracts into financial contracts. This will increase dispatch efficiency and promote liquidity in the SAPP market.</p> <p>More learning and adjustment can take place.</p>	<b>WEAKNESSES</b>	<p>The program did not contribute to ‘improved availability and affordability of electricity in the region’.</p> <p>Also, there is no ‘evidence to suggest if harmonisation of national planning and operations of the electricity sectors or regional power trade contribute to increase reliability, quality, affordability of electricity or reduced tariffs and costs’ without new impetus.</p> <p>In terms of lessons learned, opportunities for trading are not understood by member utilities/countries.</p>

SAPP PHASE III SUPPORT		EAPP PHASE II SUPPORT
<b>SUSTAINABILITY</b>		
<i>The (likely) probability of continued long-term benefit following program</i>		
<b>SCORE</b>	Satisfactory: 4.7 out of 6	Unsatisfactory: 2.3 out of 6
<b>STRENGTHS</b>	<p>The increase in trading volumes in recent years has allowed SAPP to become self-sufficient. Revenues from trading and membership fees are more than adequate to cover operating expenses. However, financial support will still be required with once off projects such as design and implementation of additional market mechanisms.</p> <p>Members have shown great commitment to SAPP. However, some respondents have raised a concern that SAPP meetings have become expensive and that an active effort / decision is required to contain meeting expectations and expenses.</p>	<p>EAPP membership revenue has gone up from about 0.5 MUSD in 2015 to 0.9 MUSD in 2017. And apart from Libya, most members have settled arrears.</p> <p>Three out of six staff hired under the program are employees of EAPP today.</p> <p>Out of a staffing plan with 20 positions, only about half of positions are filled and funded today.</p> <p>World Bank is building on the program and continuing the support for key activities funded under the program such as capacity building for planning and market development.</p>
<b>WEAKNESSES</b>	<p>SAPP does not have sufficient resources or finances to promote or develop new infrastructure. World Bank/DBSA funding is providing support.</p> <p>SAPP is also exposed due to a deficit in risk management systems, processes and resources – with specific areas of concern being forex hedging and member’ financial security management.</p> <p>Support from various regulators and governments could be improved. With growing trading volumes, it is becoming increasingly important for SAPP to clearly differentiate between its different roles. Consideration should be given to outsourcing certain functions to independent and/or professional organisations such as RERA and SADC.</p> <p>Unclear whether there was a specific exit strategy for the program.</p>	<p>EAPP still does not cover basic operational expenses, which hamper filling vacancies and conducting meetings and activities.</p> <p>Members have still not adopted and use key program results such as trading platform, which could have also increased revenue and contributed to the institutional development of EAPP.</p> <p>When trading did not take place, there was no clear exit strategy for the program support.</p>

SAPP PHASE III SUPPORT		EAPP PHASE II SUPPORT
<b>CROSS-CUTTING ISSUES</b>		
The extent to which there was no negative but positive impact on women's rights and gender equality, climate and the environment or anti-corruption		
<b>SCORE</b>	Satisfactory: 5.0 out of 6	Moderately Unsatisfactory: 3.3 out of 6
<b>STRENGTHS</b>	There were no reported negative effects on gender equality, gender reporting, corruption or environment and climate change.	No negative effects reported in interviews on gender equality or the environment.
<b>WEAKNESSES</b>	<p>Female representation at senior SAPP level is non-existent and could therefore be improved. It reflects the gender representation within member utilities.</p> <p>The SAPP played a significant role during a severe and prolonged drought in southern Africa from 2015 to 2017. Hydro generation in Zimbabwe and Zambia were seriously affected. These countries were able to rely on SAPP to help mitigate the impact of the drought.</p>	<p>There were cases of financial system weakness and this was followed by the Embassy. The agreement was eventually completed and closed.</p> <p>The program was not able to facilitate the implementation of environmental objectives as boosting renewable energy production, introducing environmental assessment procedures for power development etc.</p>

## 8 KEY LESSONS

The key lessons learned from the Review are listed and described in this chapter.

The critical prerequisites for power trade are a) existing interconnectors between countries, and b) a willingness among interconnected countries to engage in short-term power trade. Initial power trade is generally dominated by bilateral agreements between two countries and may involve third countries through which the power needs to be wheeled to reach its destination. Bilateral contracts are generally necessary to underpin investments in the transmission infrastructure.

### 8.1 Regional Planning vs National Planning

Key observations made regarding planning include:

- Too much time and resources are expended on technical studies as opposed to resolving the funding and project structuring solutions
- Technical studies can be kept continuously updated and current rather than restarted for each project.
- Each time a new consultant is engaged they start by redeveloping the network modelling software case files – these should be kept current and made available.
- To add value to national planning as well as project feasibility studies the regional planning could take a more independent and comprehensive view of national demand projections and regional trading potentials.

A very specific observation affecting both SAPP and EAPP is the challenge of interconnecting the two power pools, and the concomitant consequences for the Tanzanian and Zambian networks. TANESCO and ZESCO will require focussed support in this regard and further stakeholder engagement is needed to follow on from the Aurecon report.

#### 8.1.1 Integration of National and Regional Planning

This is essential for cost-effective investment decisions that lead to efficient development of regional power systems.

Two schools of thought exist in this regard:

1. Each country first develops its own domestic plan (an integrated resource plan) that identifies any surpluses or deficits which can be sold into or bought from the region. The regional plan is compiled as an aggregation of the national plans, with the hope that regional power supply and demand would balance.
2. An integrated regional plan is developed and the least cost, most suitable projects are identified across the region to meet demand. Each country then takes cognisance of and integrates the regional plan when developing its national plan, prioritising the identified regional projects over national projects and planning for power imports and exports accordingly.

The second approach is likely to achieve the overall lowest cost and most efficient outcome. It however disregards the aspiration of member countries to develop national projects to utilise own resources and create employment etc. Some form of balance between the two is required where national planning is undertaken, but there should be a ready acceptance of the possibility of more attractive options of meeting capacity through imports. This would require a high level of maturity, cooperation and trust.

The following hierarchy of planning is recommended:

On a national level:

1. National Integrated Energy Plan: A plan to meet all energy requirements of the country, includes electricity, liquid fuels, gas, biomass, etc.
2. Integrated Resource Plan: A long-term plan to identify electricity generation capacity requirements for the country
3. Medium Term Adequacy Assessment: Considers the electricity supply-demand balance and determines the adequacy of the system in the medium term (1-5 years)
4. Transmission Development Plan: Long-term plan focussing on the expansion and strengthening of the transmission system.

On a regional level:

1. Regional Master Plan: Considers energy sources and develops a long-term vision for the region
2. Integrated Pool Plan: Provides a long-term (20-year) outlook on capacity requirements and identifies specific projects
3. Medium Term Adequacy Assessment: Considers the electricity supply-demand balance and determines the adequacy of the system in the medium term (1-5 years)
4. Continuous network model updating, integration and sharing to ensure consistent data base

An issue that has prevented power pool master plans from being credible is the insistence of some member utilities that their national flagship projects be included. To avoid utility bias in future, the terms of reference for the power pool master plan consultants need to specifically forbid this and require an unconstrained base plan that is based on independent and credible assumptions, with realistic costs and timelines. Utility aspirations that are not reflected in the base plan can be dealt with via additional scenarios.

## **8.2 Prioritisation of Regional Power Infrastructure Investments**

Most stakeholders seem to agree that increased interconnection is an aspiration that will be of great benefit to the power pool members and the region. However, a clear commitment to develop and invest priority regional interconnection projects is mostly lacking, with the result that such projects take a long time to be realised.

### 8.2.1 Key Obstacles to Regional Interconnection

Several key challenges that will need to be overcome to realise the investments in cross-border infrastructure include:

1. National power sufficiency thinking – where countries prefer to develop their own resources rather than importing energy more cost-effectively. The “nationalistic” approach has in fact increased over time due to a lack of confidence and trust among member countries.
2. Lack of agreement and commitment among power pool members on regional priority projects
3. Reluctance to enter into long-term power supply contracts to underwrite the generation and transmission investments
4. Transmission revenues do not justify the investments required – transmission pricing is not cost-reflective and there is a delay/ unwillingness to accept a new transmission pricing methodology
5. Lack of credit-worthiness of counter-parties for generation and transmission investments – both on the underlying energy transactions and the transmission transactions – and hence the challenge to appeal to funders
6. Economy-of-scale challenges – where large energy resources are available in some countries, but national energy demand is low, requiring exports to underpin the investment
7. Lack of clear decision-making procedures – decisions are generally taken on a consensus basis and involve a large number of stakeholders (power pool organs, utilities, regulators, development partners, sponsors) whose concerns and priorities are often in conflict with one another, which in practise results in
  - Project delays
  - Time overruns
  - Additional costs
  - Compromising on key issues that potentially undermine project bankability
  - Increased risk and decreased viability and bankability as not all stakeholders understand project finance
  - Project development fatigue.

### 8.2.2 Coordination of Roles

Role players can support the development of infrastructure as follows:

ROLE PLAYERS	KEY SUPPORT TASKS
Regional Community Institutions	<ul style="list-style-type: none"> <li>• Ensure awareness and coordination of, as well as support for, regional power projects within COMESA, SADC, EAC, AU, NELSAP, etc</li> <li>• Ensure coordination of regional power projects</li> </ul>
National Governments	<ul style="list-style-type: none"> <li>• Ensure their power pool members are supported and capacitated</li> <li>• Ensure that national policies, legislation and regulations support cross-border power trade</li> <li>• Allocate resources to ensure meaningful contribution to and participation in Energy Minister forums.</li> </ul>

ROLE PLAYERS	KEY SUPPORT TASKS
Power Pools	<ul style="list-style-type: none"> <li>• Establish secure market trading platforms</li> <li>• Promote/push increased membership and participation in the market</li> <li>• Increase liquidity and stability in the markets</li> <li>• Support the design and application of cost-reflective pricing for all services, such as wheeling, balancing, losses, control area services, etc. to ensure members are not financially disadvantaged by supporting other members’ transactions</li> <li>• Explore mechanisms where counter-party risk can be transferred/devolved to other market participants – perhaps some form of reserve fund or insurance to protect participants and the pool in the event of default by service providers (energy transactions can be threatened by wheelers not being paid).</li> <li>• Ensure rules, policies and processes are open to new participants such as IPPs and possibly even loads.</li> <li>• Allocate some revenue to infrastructure investments, such as congestions income.</li> <li>• Enhance quality and timing of pool plans – especially timing as plans take so long that the information becomes redundant.</li> </ul>
Members	<ul style="list-style-type: none"> <li>• Support and accept new pricing proposals for services such as wheeling, losses, imbalance accounting, etc, where these are technically sound.</li> <li>• Place greater trade volume into the short-term markets, thus increasing liquidity, predictability and confidence in the markets.</li> <li>• Support the development of infrastructure projects – even if these have greater benefit for other members.</li> <li>• Allowing greater participation in the short-term markets by allowing IPP and even loads to participate.</li> <li>• Seriously participate in the development of pool plans and commit to implementing the identified projects and convincing government to commit as well.</li> </ul>
Regional Regulatory Bodies	<ul style="list-style-type: none"> <li>• Formalise and increase participation in pool engagements to contribute to development of new rules and policies – ensure regulatory buy-in of power pool decisions</li> <li>• Continue and increase efforts to ensure harmonisation of policies, legislation and rules across power pool.</li> <li>• Ensure individual regulators buy in to power pool generation and transmission plans and that individual countries’ regulations do not impede such plans – i.e. cross-border transmission investment should be treated similarly to domestic transmission investments.</li> <li>• Encourage the promotion of more cost reflective pricing by their members – both in terms of price level, but also in terms of structure – where appropriate allocation between fixed and variable costs allow for competition.</li> </ul>
Development Partners	<ul style="list-style-type: none"> <li>• Good coordination of development partner programs to avoid overlaps, duplication and conflicts</li> <li>• Wider consultation before finalisation of scope of work for projects</li> <li>• Coordination of development partners through a joint support programme spearheaded by a lead partner (rather than individual development partners all engaging directly with support recipients)</li> </ul>



ROLE PLAYERS	KEY SUPPORT TASKS
	<ul style="list-style-type: none"> <li>• Clear specification of purpose, targets and outcomes envisaged for support programs</li> <li>• Support of power pools and regional regulatory bodies with capacity building and funding specific initiatives (eg studies and tools)</li> <li>• Support to power pool members to identify regional projects and to fund project preparatory and development costs to financial close – with specific focus on supporting the business case</li> <li>• Provide investment/debt funding to close the gap for projects which fall short of full economic justification but are important regional assets.</li> <li>• To recognise that transmission projects should attract very attractive funding and act a “loss leader” where returns can be made on the underlying energy transactions and indirect benefits such as economic growth stimulation.</li> <li>• Support power pools and members to coordinate fund raising to achieve specific goals.</li> </ul>

### 8.2.3 SAPP and EAPP Governance Structures

SAPP and EAPP are supposed to have several roles that include:

- System Operations
  - Technical coordination of the Pool (TSO Coordination)
  - Operational performance monitoring and application of penalties for transgressions
  - Developing new operational rules and procedures
- System Planning
  - Energy and Grid Expansion Planning/Pool Plan development
  - Project readiness assessments
  - Project preparation
- Markets
  - Rule Design
  - Market Operator
  - Invoicing and energy reconciliation
  - Dual currency financial settlement
  - Financial security management
  - Market surveillance
  - Risk management

With increasing levels of short-term trade together with an expanding reach of the markets, these multiple roles can be problematic and, in some cases, could be perceived as creating a conflict of interest. Other power pools around the world deal with this by splitting the roles between a number of organisations (eg in Europe there are the European Network of Transmission System Operators for

Electricity ENTSO-E, various trading entities, Coreso doing technical coordination, the EU developing market rules, etc.).

A critical review of the numerous roles of SAPP and EAPP should be undertaken, and roles allocated to other organisations where appropriate. This could include appointing banks or other financial institutions to do market risk management, financial settlement and security management. Another example is that RERA – which currently plays a very muted role in SAPP and there appears little integration of efforts – could play a greater role in rule development and market oversight/surveillance. Oversight and surveillance cannot be undertaken by the power pool alone and there needs to be greater independent oversight to protect the interest of all the market participants.

SAPP and EAPP have no specific authority over members and besides reporting up to the Energy Minister’s meetings there appears little ongoing political support and commitment. This area may need to be strengthened – both in terms of ensuring more decision-making autonomy by the power pools and enhancing political support – to ensure increased coordination and commitment to cost-effective power infrastructure investments.

#### **8.2.4** A Trans-National Mandate for Power Infrastructure Investments?

In response to the challenges with realising regional infrastructure projects, SAPP recently (in 2016) established a Project Advisory Unit (PAU) with the specific intention of facilitating and fast-tracking transmission investments by supporting SAPP members with project preparatory funding and access to resources and skills to achieve financial close on the identified projects. However, to date the PAU has not created the momentum needed to facilitate such investments, and some stakeholders noted during interviews that the PAU has added another layer in the already complex project governance process. Also, the expenditure efficiency of the PAU has been questioned.

Another structure to be considered is a “trans-border investment body” as exists in the West African Power Pool, which has been mandated by the respective governments to develop cross-border projects. Such a regional investment vehicle could be administered by COMESA, to cater for both southern and east African countries.

### **8.3 Institutional Capacity Building**

#### **8.3.1** Pre-conditions for Effective Capacity Building

For capacity building to be effective, certain pre-conditions that need to be in place or addressed by a capacity program have emerged from the Review, as shown in the following figure and further explained below.

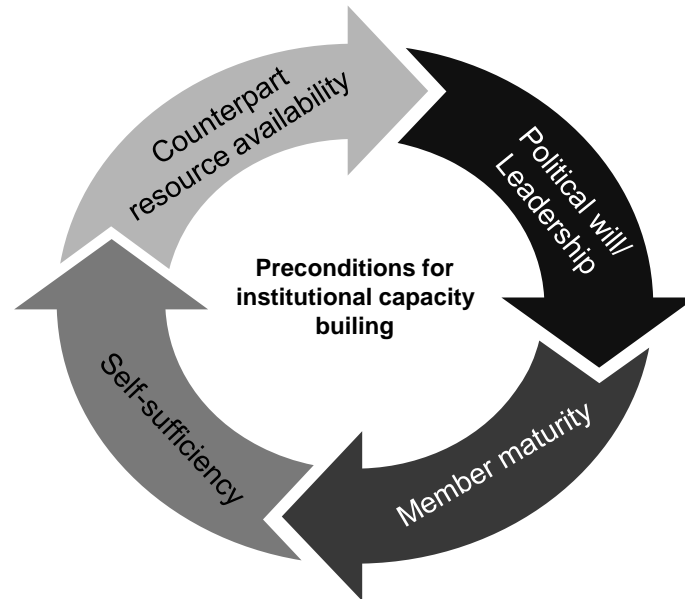


Figure 12: Preconditions for Successful Capacity Building

- a. **Counterpart resources availability:** It is important that the recipient institutions are resourced so that there is a counterpart to capacitate. In the case of EAPP, it is evident that technical staff has benefited from the capacity building support, but it is important that there is a critical mass and that other pre-conditions are in place as below.
- b. **Self-sufficiency:** it is important that the recipient to a large extent is self-sufficient to cover critical expenditure and maintain staff. Power pools need to be able to generate sufficient revenue to cover the costs of all core expenditure items such as holding committee meetings and funding core staff etc.
- c. **Political will and leadership:** Regional power trade is first and foremost a political decision, and without willingness and leadership within the management of the power pool and its members, it is difficult to capacitate a structure to facilitate trade. The lack of actual trading within EAPP is an example of this, where better leadership and more focus on the willing could have brought about actual trading.
- d. **Member maturity:** Sound utilities and regulators that are able to implement at national level are needed for power pools to be successful i.e. capacity to plan, construct, operate, maintain and trade power.

For a more detailed discussions on assumptions and casual links for regional power trade, see Chapter 9: Theory of Change.

8.3.2 Cross-Pool Sharing of Knowledge, Experience and Systems

It is important that approaches and interventions are adapted to the level of maturity of the power pools – and that the interventions are tailored to respective needs and stages of development as shown in the following figure.

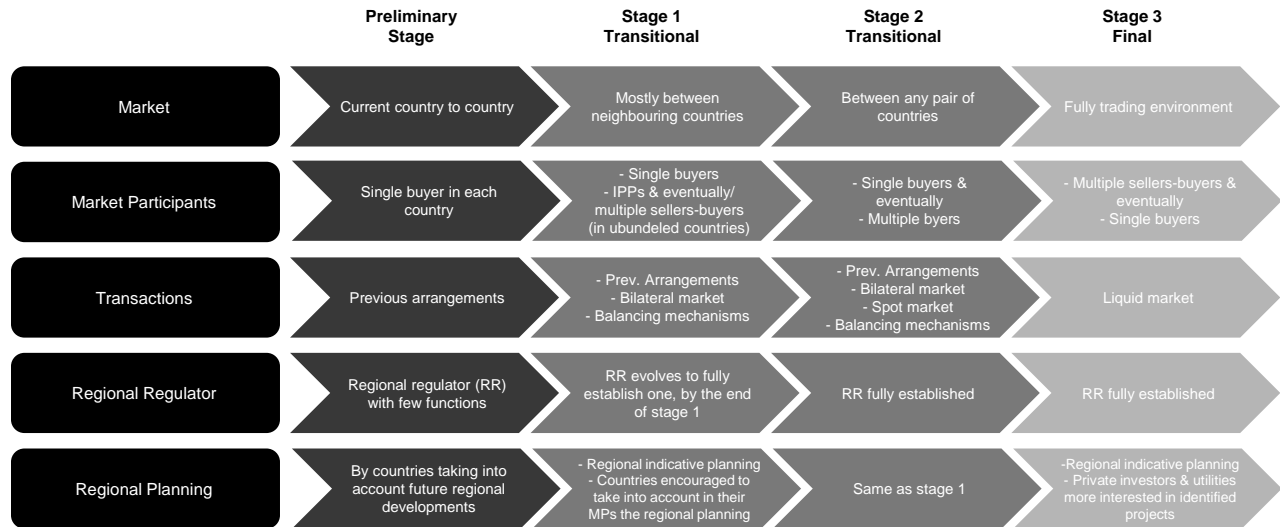


Figure 13: Strategic Roadmap and Stages of Market Design

Source: EAPP project document

A common framework and how to go about building power pools, as learned from this Review, is documented Chapter 9: Theory of Change.

There is a lot of potential for cross-pool sharing of knowledge, experience and systems. Although EAPP was not able during the program to leap-frog and gain from the SAPP experience (which had a 5-10 year head-start), EAPP can learn a lot from SAPP and operational and trading synergies can be improved. This can be done through staff exchanges and lessons learning, and potentially through a shared trading system. Although EAPP's trading platform is sufficient to start trading today, EAPP could use SAPP's platform in the future, as there is no need to acquire or develop a new, more sophisticated platform. Now that SAPP's trading volume is picking up, it is also an important demonstration example to EAPP member state decision-makers.

8.4 Timing and Purpose of Power Trading Mechanisms

Some important lessons regarding the timing of power trading mechanisms, based on experiences in SAPP and EAPP, are described below.

8.4.1 Early Shadow Trading to Build Capacity and Confidence

Under the Twinning arrangement in EAPP member utilities have built some confidence in short-term power trade through shadow trading on the existing interconnectors between Sudan and Ethiopia, and

Kenya and Uganda. While the nominal capacity of these interconnectors is fully committed in bilateral contracts, fluctuations in supply and demand during the day still enabled short-term trades.

A simple excel-based trading platform was developed for the purpose, providing daily trading practice over a 6-month period to build capacity and confidence among participants, who agree that this was a very useful exercise. Significantly, the commercial gain achieved by the shadow trading amounted to 20MUSD over the 6-month period, according to EAPP-GS.

The shadow trading experience was certainly a beneficial exercise for the nascent power pool and the member utilities that participated, and can be replicated in similar circumstances to expose members to short-term trading before going live. It is, however, important that such an initiative progresses timeously to live trading to realise real benefit.

#### **8.4.2** Transition from Shadow Trade to Live Short-Term Trade

What has not yet been achieved in EAPP is the transition from shadow trade to live short-term trade, with the main obstacles mentioned by interviewees including

- A lack of spare capacity on the interconnectors for short-term trade – despite the shadow trading having demonstrated that this is still possible and beneficial without dedicated spare capacity)
- The lack of a proper trading platform and financial settlement mechanism – despite the ADAM platform being adequate for live trading
- The absence of formal short-term trading agreements between the utilities
- Lack of a SCADA system in EAPP to manage trades.

The RT has recommended to EAPP-GS to push forward with implementing live trade on these small interconnectors so that the utilities and the GS have experience and confidence to take on larger trades immediately once new interconnectors like Ethiopia-Kenya, Kenya-Tanzania and Zambia-Tanzania are commissioned.

Entering into formal short-term trading agreements (preferably using the SAPP trading platform), establishing a financial settlement mechanism and possibly acquiring a SCADA system for EAPP are relatively small obstacles to overcome and should be actioned immediately. Funding can possibly be sourced from development partners under existing support programs.

#### **8.4.3** Increase in Trading Volumes and Market Participation

Experience in SAPP has shown that short-term trade volumes increase rapidly once member utilities gain confidence in the trading mechanism, provided that there is spare capacity on the interconnectors. Key to this is the guaranteed settlement once a trade has taken place.

SAPP has recently amended its order of priority given to various transactions when granting wheeling rights. Previously, firm and non-firm bilateral agreements took priority over short-term market transactions. Non-firm bilateral agreements have now been relegated to after market transactions, thereby allocating transmission capacity to market transactions first before such capacity is consumed by non-firm bilateral agreements.

#### **8.4.4** Progressing EAPP Development by Adopting SAPP Experience

With SAPP being more advanced in its development than EAPP it is highly recommended that the two power pools cooperate closely for EAPP to progress more rapidly without having to go through the same extensive learning curve as SAPP. Some of the shortcuts that EAPP may consider include

- Adoption of the SAPP market platform and trading mechanisms (which the authors understand has in the meanwhile been agreed), instead of developing or adopting a parallel platform and trading mechanisms
- Adoption of the SAPP financial settlement mechanism
- Exchange visits (and/or temporary secondments) of key EAPP staff and operators to selected SAPP members that are active in trading
- Adoption of SAPP Market rules and systems to avoid duplicate systems when the two networks are interconnected.

#### **8.4.5** Market Diversification

SAPP has seen a steady progression from bilateral trading only to the Day-Ahead Market and more recently the Forward Physical and Intra-Day Markets.

The Forward Physical Markets provide the opportunity for buyers to secure a specific required profile for a month or week ahead and gain certainty of delivery. The DAM offers the opportunity to ensure supply-demand balance on a planned basis, while the IDM contributes to solving unanticipated variations closer to real time – i.e. responding to changes in load or plant failures.

The final physical market offering will be the Balancing and Ancillary Services Market/s which ensure members who remain out of balance fairly and accurately compensate other members who support their systems in real time.

In addition to physical markets the opportunity for financial markets exists. Financial contracts offer greater flexibility, more efficient dispatch and payment certainty if traded through the SAPP markets. Members have been slow in developing financial products to manage price risk in the SAPP. With the increase in trade and the deepening of the market liquidity, financial products can fulfil an important role in driving further efficiencies and managing price risks. A number of private parties have already expressed interest in developing and offering financial products based on SAPP spot prices. These players are very keen to proceed and are currently considering options. SAPP should work closely with these parties to facilitate new products and services.

### **8.5** **Cross-Cutting Issues**

#### **8.5.1** Gender Development

Gender equality does not appear to have been incorporated into design nor implementation of the EAPP and SAPP programs, but there were no reported negative effects on gender equality during the Review as a result of the programs. The Review Team was able to establish that women, while well represented in

SAPP's Environmental Sub-Committee and the Legal Working Group, are underrepresented in technical committees such as Operations and Planning. Further, there are no women in the SAPP Executive Committee, and very few at senior level amongst the SAPP Coordination Centre staff. The situation is similar in EAPP.

It was further noted that there is no significant reporting on gender development in SAPP's monthly or annual reports. The Review Team could also not find clear references to gender targets and milestones that were set by the support agencies or by SAPP. It could be argued that this situation will only change if gender development is made a top priority during recruitment processes. Management should also encourage the active development of a succession plan that targets the promotion of women talent to ensure a pipeline of individuals who are able to succeed existing managers when their positions become vacant. It is also recommended that gender issues are measured and reported against agreed targets. This will further increase visibility of this important issue.

EAPP and SAPP could potentially contribute to bettering the life of women and gender equality through provision of energy that is cost efficient, healthy and good for the environment, but those potential downstream benefits are still not realized, nor have they been studied and documented.

#### **8.5.2** Environmental Activities

During 2018 SAPP completed an update of the Environmental and Social Management Framework (ESMF). The purpose of the ESMF is to serve as a reference manual in the high-level environmental and social screening of projects. It is anticipated that this will strengthen the assessment, mitigation and management of risks and impacts for large power infrastructure projects. This tool is particularly relevant where project loans are required from international financial institutions that apply international standards to safeguard environmental and social sustainability. It is expected that the ESMF will contribute to more compliant projects and faster development and approval processes.

What is worth highlighting are the broad consultative processes that were followed in developing the ESMF. For example, during the development of the initial ESMF, in 2016, stakeholders (e.g. utilities, government ministries and agencies, development financial institutions and associations) were consulted in a number of ways, including workshops, site visits, focus group meetings, face-to-face meetings and telephonic interviews. During the update of the ESMF in 2018, stakeholders from civil society organisations, financial institutions, research organisations and utilities were consulted. Stakeholders raised planning, institutional, technical, funding and management issues pertaining to the development and implementation of energy projects, which informed the ESMF development process.

The above activities are a clear example of how SAPP can be used to promote collaboration between various intuitions that play a role in the energy arena. This approach is important in aligning and harmonising regional environmental policies, procedures and approaches. Although this approach takes time to implement it provides for more robust and sustainable outcomes.

A similar approach could be used in building consensus in promoting increased access to SAPP's trading platforms. This is seen as a vital step in positioning SAPP as the preferred method for trading electricity not only between utilities but between other role-players including IPPs and large customers.



## 9 RECOMMENDATIONS FOR KEY ROLE PLAYERS

This Chapter lists the main recommendations that emanated from the Review, for the key role players.

### 9.1 Regional Community Institutions

Regional institutions like the African Union, COMESA, SADC and EAC have the mandate to promote regional initiatives and influence perceptions about the potential benefits of regional power integration. It is recommended that these institutions (continue to) proactively encourage debate about regional power projects by, for example, facilitating and funding suitable forums to do so and encouraging key decision makers to participate.

Another way in which regional community institutions can contribute to a more efficient effort towards realising power integration is the facilitation and funding of regular meetings of the EAPP Technical Committees.

### 9.2 National Governments

National governments of the power pool member countries have a crucial role in ensuring regional integration of the power systems. Their consideration at national level of the benefits of regional power projects will enhance the broader understanding of the opportunities of regional power trade that may bring significant economic benefits to the region, individual countries and end users.

It is recommended that national governments have regional power projects as an agenda item when debating national power supply issues in parliament and other forums. National energy policies should always incorporate a regional perspective to power supply issues, so that legislation and regulations are obliged to support cross-border power trade where relevant.

It is further recommended that national governments mandate their power utilities and energy regulators to actively engage in power pool matters and ensure that requisite budgets are available to do so.

### 9.3 SAPP

SAPP is already a functional power pool. The main recommendations are:

- To expand membership to IPPs, large power users and financial investors.
- To introduce financial market mechanisms.
- To review the numerous roles of SAPP with the aim to avoid (or at least minimise) conflicting situations and allocating or sharing some roles (such as risk management, financial settlement, security management) to/with other institutions that are better suited to deal with these responsibilities.
- To empower SAPP with more decision-making autonomy regarding the realisation of priority regional power projects (some lessons in this regard may be drawn from the West African Power Pool).
- To avoid utility bias in future, the terms of reference for the power pool master plan consultants need to specifically forbid this and require an unconstrained base plan that is based on independent and

credible assumptions, with realistic costs and timelines. Utility aspirations that are not reflected in the base plan can be dealt with via additional scenarios.

#### **9.4 EAPP**

For EAPP to become a functional power pool it will need to commence short-term trading. The main recommendations are:

- To exploit the SAPP experience and immediately implement measures that will enable commencement of live trading on the existing interconnectors (Sudan-Ethiopia and Uganda-Kenya), which include
  - entering into formal short-term trading agreements between the parties, and
  - implementing a settlement mechanism – preferably the same one as is used in SAPP (which the authors understand has meanwhile been agreed by the two power pools).
- To commence live trading as soon as these measures are in place. This will develop valuable experience and build confidence among members, in preparation for larger volume trades on future interconnectors.
- To adopt (and possibly adapt) the SAPP trading platform for EAPP. Since the two power pools will be interconnected it does not make sense for EAPP to acquire or develop a separate platform.
- To establish the Market Committee as soon as possible.
- To ensure that Technical Committees meet on a regular basis.
- Similar to SAPP, to review the EAPP governance structure and outsource certain roles that may create conflicts with other core roles. The structure of the EAPP Secretariat should be reviewed, with a view to enhancing the sustainability of the EAPP.
- To implement a more transparent system of staff recruitment.
- To empower EAPP with more decision-making autonomy regarding the realisation of priority regional power projects (some lessons in this regard may be drawn from the West African Power Pool).

#### **9.5 National Power Utilities**

National power utilities, as members of the power pools, are the key entities that engage in short-term trading. The main recommendations for the utilities are:

- To establish and capacitate utility trading departments that are mandated to engage in trading in the power pool (this relates primarily to EAPP members as SAPP members are already well advanced in this area).
- To mandate and support their staff to participate in power pool Technical Committees.
- To include and consider key regional power projects in national power system planning.
- To pro-actively engage with potential trading partners with a view to achieve more economical power supply.

## 9.6 Development Partners

The support of development partners in facilitating regional power projects, establishing market mechanisms, and building capacity in the power pools, utilities and regulators has been necessary to achieve the present status of development and will need to continue until key infrastructure has been established, the market mechanisms are in place and functional, and the institutions are fully capacitated.

The main recommendations for development partners emanating from this Review are:

- To coordinate support from development partners through forums like the Multi-Donor Trust Fund.
- To focus on areas that further support and enhance the positive SAPP trading experience, such as
  - Opening the market to additional players (IPPs, financial traders),
  - Introducing financial markets.
- To focus on areas that enable EAPP to commence trading as soon as possible, such as
  - Facilitating formal short-term trading agreements between the trading parties, and
  - Implementing a settlement mechanism that can be used in conjunction with the ADAM trading platform
- To enable EAPP Technical Committees to meet on a regular basis.
- To facilitate the adoption by EAPP of the SAPP trading platform.

## 10 THEORY OF CHANGE: RECOMMENDATIONS FOR FUTURE DONOR SUPPORT TO REGIONAL POWER TRADE

Based on the lessons from this Review, the following elements emerge as a contribution towards developing a more holistic and consistent Theory of Change (ToC) for regional power integration in Africa. A ToC describes the causal logic of how and why a program would deliver its intended outcomes and produce change. It is therefore not just important to understand required activities and interventions, but also underlying assumptions and preconditions that are needed for achieving desired results. This is especially true of complex regional integration projects where the scope of an intervention program has to be limited and focused.

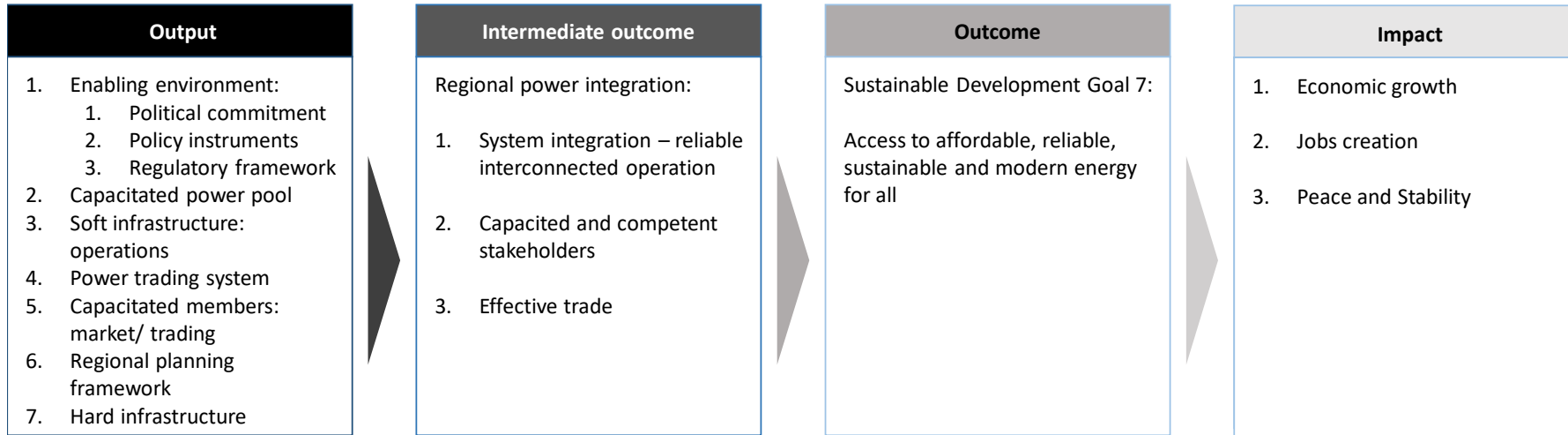
### *Box 2: Theory of Change*

A Theory of Change demonstrates how an intervention program understands:

1. The context for the intervention, and the factors, events and actors that might influence change
2. The long-term change that the intervention seeks to support, and who will benefit from that change
3. Process (sequence) of change anticipated in order to create the conditions for the desired long-term outcome. These are the actions and casual mechanisms that produce change
4. Assumptions about how these changes might happen, as a check on whether the activities and outputs are appropriate for influencing change in the desired direction in this context.

The Theory of Change is graphically illustrated in the Figure on the next page.

The key interventions and measurable outputs that are needed for regional power integration are described below.



**Assumptions**  
Outputs lead to Intermediate outcome if:

1. Political will to undertake regional integration
2. Sound national utilities and regulators able to implement at national level
3. Adequate institutional and financial resources are allocated

**Assumptions**  
Intermediate outcomes lead to outcomes if:

1. Willing buyer/ seller
2. Efficient trade mechanisms are prioritized on system
3. Confidence in system

**Assumptions**  
Outcomes lead to impact if:

1. Macroeconomic environment is conducive for private sector development
2. Favorable global economic environment
3. Inclusive growth

Figure 14: Theory of Change

### 10.1 Outputs

OUTPUTS	DESCRIPTION
1. Enabling environment	<p><u>Political commitment</u></p> <ul style="list-style-type: none"> <li>• Inter-governmental MOU</li> <li>• Inter-utility MOU</li> <li>• Operating agreement</li> <li>• Empowered and pro-active steering committee</li> <li>• Clear principles that encourage wider power pool membership, to enhance market dynamics and drive economic efficiency</li> <li>• Clear principles for regional power infrastructure prioritisation</li> <li>• Trans-national mandate for power Infrastructure Investments</li> <li>• Decision-making on regional power projects at inter-governmental level</li> </ul> <p><u>Policy instruments</u></p> <ul style="list-style-type: none"> <li>• Regional energy policy</li> <li>• Regional targets and goals (generation mix, electricity access, cost of electricity)</li> <li>• Harmonised national energy policies, laws and regulations</li> </ul> <p><u>Regulatory framework</u></p> <ul style="list-style-type: none"> <li>• Regional energy regulatory body</li> <li>• Regional market rules and regulations (standards, codes and procedures)</li> <li>• Independent market oversight and surveillance</li> <li>• Compliance and enforcement mechanism (to ensure adherence to standards, codes and procedures)</li> <li>• Transparent wheeling tariff setting methodology</li> <li>• Dispute resolution mechanism</li> </ul>
2. Capacitated power pool	<ul style="list-style-type: none"> <li>• Adequate revenue to cover all costs</li> <li>• Clear organisational structure that minimises conflicts of interest</li> <li>• Clearly defined roles and mandates of power pool organs</li> <li>• Adequately resourced organs (key positions filled with competent resources)</li> <li>• Pro-active steering committee</li> <li>• Visionary leadership (at the level of executive/steering committee, technical committees and general secretariat/coordination centre)</li> <li>• Technical Committees meet on a regular basis</li> <li>• Competent operational resources</li> </ul>
3. Soft infrastructure	<ul style="list-style-type: none"> <li>• Interconnection code</li> <li>• Operating guidelines</li> <li>• Energy management systems (SCADA, metering and communications protocol)</li> </ul>
4. Power trading system	<ul style="list-style-type: none"> <li>• Membership open to IPPs, large users and financial traders</li> <li>• Appropriate trading platform</li> <li>• Short-term trading mechanisms (eg DAM, FPM, FPW, IDM, balancing and ancillary market, financial markets)</li> </ul>

OUTPUTS	DESCRIPTION
	<ul style="list-style-type: none"> <li>Financial settlement and guarantee mechanisms</li> <li>Trade anonymity</li> <li>Bilateral trade through long term Power Purchase Agreements that also enables financing of regional infrastructure</li> </ul>
5. Capacitated members	<ul style="list-style-type: none"> <li>TSOs established in national utilities</li> <li>Market trading units established in national utilities</li> <li>Short-term trade an integral part of national demand-supply balancing</li> </ul>
6. Regional planning framework	<ul style="list-style-type: none"> <li>Pool planning committee</li> <li>Regional demand forecasting mechanism</li> <li>Regional master plan (dynamic)</li> <li>Up-to-date and accessible regional power system model case files</li> </ul>
7. Hard (physical) infrastructure	<ul style="list-style-type: none"> <li>Generation plants</li> <li>Transmission lines and substations</li> <li>Interconnectors</li> </ul>

## 10.2 Intermediate Results

INTERMEDIATE RESULTS	DESCRIPTION
System integration – reliable interconnected operation	<ul style="list-style-type: none"> <li>Active short-term trading among members</li> <li>Improved supply-demand balancing</li> <li>Reduced load shedding</li> </ul>
Capacitated and competent stakeholders	<ul style="list-style-type: none"> <li>Trader diversity</li> <li>Trading mechanism diversity</li> </ul>
Effective trade	<ul style="list-style-type: none"> <li>Significant short-term trade volumes in addition to traditional bilateral trade through Power Purchase Agreements that are important to finance large infrastructure projects</li> <li>Improved power system economics</li> </ul>

## 10.3 Key Assumptions and Pre-Conditions

It is important that the pre-conditions and assumptions are in place for power trade to materialize such as the structural, geographic and cultural factors. For instance, eight out of 19 countries in COMESA are land-locked, creating an underlying need for regional integration, while four are island states.<sup>1</sup> Below are

<sup>1</sup> <https://ecdpm.org/wp-content/uploads/ECDPM-2016-Political-Economy-Regional-Integration-Africa-Synthesis-Report.pdf>



some key necessary but not sufficient assumptions that need to be in place for energy trade to materialize within the ToC.

OUTPUTS LEAD TO INTERMEDIATE OUTCOME IF:	DESCRIPTION
1. Political will to achieve regional integration	<ul style="list-style-type: none"> <li>Political commitment expressed in IGMOU and IUMOU is pro-actively pursued at energy minister level – but also heads of state. For this to happen, regional integration has to be within the national interest as defined by the ruling elite, otherwise it is just empty words</li> <li>Champions are needed to drive the process. South Africa has been key to early success in SAPP. This may indicate that to push for integration, it may be better that a coalition of the willing lead the way rather than that every state moves at the same pace. This also appears to be a finding from the shadow trading exercise in EAPP.</li> <li>Key regional infrastructure projects are prioritised over national projects in the interest of regional integration</li> </ul>
2. Sound national utilities and regulators able to implement at national level	<ul style="list-style-type: none"> <li>National master plans integrate regional master plan assumptions and priorities</li> <li>TSOs proactively coordinate with power pool organs</li> <li>National market trading units actively engage in short-term trade to enhance national power system economics</li> <li>National regulators coordinate regulation with regional regulatory bodies</li> </ul>
3. Adequate institutional and financial resources are allocated	<ul style="list-style-type: none"> <li>Power pool organs and national utilities are adequately resourced and capacitated to enable efficient short-term power trade</li> <li>Membership fees and trade revenue cover operational costs of power pools</li> <li>Financial resources are available to be allocated for regional power infrastructure project development</li> </ul>

INTERMEDIATE OUTCOMES LEAD TO OUTCOMES IF:	DESCRIPTION
1. Willing buyer/seller	<ul style="list-style-type: none"> <li>Increasing power pool membership</li> <li>Active market participation by all members</li> </ul>
2. Confidence in system	<ul style="list-style-type: none"> <li>Active short-term trading</li> <li>Significant trade volumes</li> </ul>
3. Efficient trade mechanisms are prioritized on system	<ul style="list-style-type: none"> <li>Diversity of trade mechanisms enables more efficient and cost-effective power system operation</li> </ul>

#### 10.4 Key objectives and higher-level indicators

Below are some key objectives and performance indicators emerging for a Theory of Change.

<b>OBJECTIVES AND HIGHER-LEVEL INDICATORS:</b>	<b>DESCRIPTION</b>
1. Effective power trade	<ul style="list-style-type: none"> <li>• Absolute regional trade volumes and as a share of total electricity supply</li> <li>• Share of the Day-Ahead Market (DAM), Forward Physical Market – Monthly (FPM), Forward Physical Market – Weekly (FPW) and Intra-Day Market (IDM) of trade</li> </ul>
2. Improved conditions on the supply side	<ul style="list-style-type: none"> <li>• Reduced coincident peak load of the regional power pool, compared with the sum of the individual peak loads for each national power grid</li> <li>• Mutually utilized power generation reserves for the interconnected national power grids</li> <li>• Increased robustness of power supply to meet unexpected events, such as load growth above forecast and/or delayed commissioning of power generation/transmission projects; and increased reliability</li> <li>• Lower operation costs due to economy energy exchanges</li> <li>• Postponed and lower investments in power generation plants due to least-cost development of regional energy resources and reduced costs of maintaining power generation reserves</li> </ul>
3. Increase the share of renewable energy in the regional energy mix	<ul style="list-style-type: none"> <li>• Renewable energy share in the total final energy consumption</li> </ul>
4. Regional power infrastructure development	<ul style="list-style-type: none"> <li>• Mobilized amount of United States dollars per year/ % of funding needs in master plan mobilized</li> </ul>

## 11 APPENDICES

### 11.1 Appendix 1: List of Key Documents

RECEIVED DOCUMENTS	FORMAT	DATE
<b><i>EAST AFRICAN POWER POOL</i></b>		
EAPP Corporate Plan 2012-2014	PDF	feb-12
Appraisal of the proposed EAPP programme	PDF	09-may-12
EAPP Decision Document	PDF	01-jun-12
EAPP PD final Sept 2012	PDF	01-sep-12
EAPP mid-term review – final report (Norconsult)	PDF	20-dec-12
EAPP mid-term review – final report (BDO)	PDF	14-aug-14
EAPP regional power system master plan – Executive Summary	PDF	Dec-14
EAPP regional power system master plan – Vol I: Main Report	PDF	Dec-14
EAPP regional power system master plan – Vol II: Data Report	PDF	Dec-14
EAPP regional power system master plan – Vol III: Results Report	PDF	Dec-14
EAPP regional power system master plan – Executive Summary	PDF	Dec-14
2014 end-of-year and final report (revised)	PDF	Jan-15 (?)
EAPP Twinning – project completion report - final	PDF	9-feb-15
EAPP Twinning – project completion report	PDF	16-mar-15
EAPP roadmap draft	PDF	15-dec-15
EAPP strategic plan 2016-2026; Briefing Note	PDF	Dec-15
Independent auditor’s report	PDF	5-aug-16
EAPP reiserapport final	Word	jan-16
<b><i>SOUTHERN AFRICAN POWER POOL</i></b>		
SAPP end-term review of SAPP support	PDF	19-jun-08
SAPP appropriation document	PDF	17-nov-08
SAPP-MFA agreement (incl decision document and PD)	PDF	26-feb-13
SAPP mid-term review final draft report (Multiconsult/Norplan)	PDF	28-may-14
Overføringsnotat	PDF	27-may15

## 11.2 Appendix 2: List of People Interviewed

In addition to the two countries that host the EAPP and SAPP headquarters, the RT visited two additional countries in each power pool. The six countries visited were:

- Ethiopia, which hosts the EAPP General Secretariat
- Zimbabwe, which hosts the SAPP Coordination Centre
- Rwanda, which hosts the NELSAP headquarters
- Tanzania, which is a member of both power pools
- South Africa as the largest power market in SAPP, and
- Mozambique, which is the only country in the SAPP that has surplus capacity, and which has a prominent independent power producer (IPP) and an independent transmission company (ITC).

The following stakeholder organizations in each of the countries were interviewed for this assignment:

COUNTRY	CATEGORY	STAKEHOLDER ORGANISATIONS
Ethiopia	EAPP	Independent Regulatory Board, General Secretariat
	Electric Utility	EEPCO
	Energy Ministry	Ministry of Water, Irrigation and Electricity
	Energy Regulator	Ethiopian Electricity Authority
	Development Partners	Norway, Sida, Danida, EU, AfDB, WB, USAID
Rwanda	Regional development organisation	NELSAP
	Electric Utility	REG
Tanzania	Electric Utility	TANESCO
	Energy Regulator	EWURA
	Development Partners	AfDB, World Bank
Zimbabwe	SAPP	Coordination Centre, Executive Committee, Planning Subcommittee
	Electric Utility	ZESA
	Energy Ministry	MEDP
Mozambique	Electric Utility	EDM
	IPP	HCB
	ITC	MOTRACO
	Energy Ministry	MIREME
South Africa	Electric Utility	ESKOM
	Energy Ministry	Department of Energy
	Energy Regulator	NERSA
	Development Partners	AfDB, DBSA, Power Africa SAEP

### 11.3 Appendix 3: Terms of Reference

**Terms of Reference  
for  
a Joint Review  
of Swedish/Norwegian Support to  
the Southern Africa Power Pool and the Eastern Africa Power Pool**

#### 1. Introduction

The Southern Africa Power Pool (SAPP) was established in 1995 and the Eastern Africa Power Pool (EAPP) in 2005. Both pools with the aim to promote regional power trade, sustainable and affordable energy supply, investment and economic development, as well as general regional integration.

On background of the Nordic power market established in the 1990's and early 2000, cross-border cooperation and power trade has been a priority area of support in Swedish and Norwegian development cooperation. Energy access is considered important for social and economic development, and regional power trade is regarded as a means to improve system efficiency and the availability of electricity.

The support from Norway to both SAPP and EAPP has been significant. Norway has supported SAPP in three phases since 2003. The cooperation is now in its third phase and Sweden has contributed to finance phase two and three. The total amount of support is more than 100 million NOK.

Similarly, Norway has supported EAPP in two phases since 2009. In the second phase of support for EAPP has Sida co-financed program. The total amount of support exceeds 29 million NOK.

Program	Phase	Norway NOK mill	Sweden
Southern Africa Power Pool (SAPP): Support on infrastructure planning and establishment of a competitive market	I (2003-2008)	35.44	SEK mill
	II (2008-2012)	22.50	12.00
	III (2012-2015)	<u>18.25</u>	<u>20.00</u>
	<b>Total</b>	<b>76.19</b>	<b>32.00</b>
East African Power Pool (EAPP): Capacity building to operationalise the Coordination Centre and the Independent Regulatory Body	I (2009-2012)	12.08	NOK mill
	II (2012-2014)	<u>12.03</u>	<u>5.52</u>
	<b>Total</b>	<b>24.11</b>	<b>5.52</b>

The Phase III cooperation agreement with SAPP was signed in February 2013. The Phase II cooperation agreement with EAPP was signed in June 2012. Sida joined the support programme through a delegated cooperation agreement with Norway as lead donor and an addendum to the agreement with EAPP signed in November 2012.

Both cooperation agreements have been provided no-cost extensions. The cooperation with SAPP is still ongoing and will be closed in 2019. The cooperation agreement with EAPP have been completed and the programme was formally closed in July 2017.

These institutional cooperation programmes with SAPP and EAPP has been complemented by:

- Capacity building and technical assistance from other development partners, including AfDB, AFD, EU, JICA, USAID (through Power Africa) and WB...
- Support for the planning of physical infrastructure for power trade<sup>2</sup> and energy generation

#### Key objectives for the support to EAPP and SAPP

The purpose of the phase III support to SAPP is to implement an efficient regional spot market, with the development goal of least cost environmentally friendly affordable energy and accessibility in Southern Africa, both through the development of the regulatory environment (grid codes, trading regimes etc) and the physical infrastructure, particularly the construction of inter-national transmission lines.

The phase II support to EAPP the goal is formulated more immediate to the core functions of EAPP to provide system operation coordination regulatory service for the regional power market. (Phase I of the support to EAPP had a purpose and goal all similar to the Phase III support to SAPP for the Eastern Africa region.)

The results framework for the two cooperation programmes is summarised in Annex I with more details.

In addition to these bilateral support programs, a larger fund for coordinated support from donors has been set up 2015 under the Advancing Regional Energy Projects Program, with the World Bank as the main contributor and Sweden a secondary contributor. The intent of the program is to continue the Norwegian/Swedish bilateral assistance, and is thus somewhat overlapping in scope and content. The program builds in East Africa on a Road Map and a Master Plan, and in Southern Africa on an agreed expansion program.

## **2. Purpose**

The purpose of this joint review is 1) to assess the relevance, effectiveness, efficiency and sustainability of the support to EAPP and SAPP, and 2) to learn key lessons on what worked and what did not work in these development cooperation programmes.

The review can help document and provide basis for reporting to the general public the achievements of these programmes who are now completed or close to being completed, compare experiences and

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<sup>2</sup> The Norwegian programme includes support to feasibility assessment of the following regional infrastructure projects: Uganda–DRC interconnector, Kenya–Tanzania interconnector, Rusumu Falls Hydroelectric and Multipurpose Development project (joint with Sweden and WB), The Mozambique Regional Transmission Development programme (SADC multi-donor trust fund managed by the WB), and Tanzania–Zambia interconnector (joint with Germany (KfW)).

lessons learned from supporting two power pools with similar challenges but in different stages of development, and inform the design and implementation of future development cooperation to support regional power trade.

### **3. Scope**

Assess/document the main results and achievements of the projects, and on this basis discuss key lessons.

For the assessment of the main results and achievements, the OECD/DAC standard review/evaluation criteria shall be applied, including assessment of relevance, efficiency, effectiveness and sustainability.

In particular, the review shall assess, but not be limited to the following issues or items:

- The relevance of the programmes to development priorities of the member state and the political commitment of member states to partake in regional power trade.
- The active involvement of relevant member states institutions in setting priorities for EAPP and SAPP, as well as regional power planning and harmonisation discussion/processes.
- The relevance and quality of the technical assistance provided.
- To what extent the outputs, goal and propose for the respective programmes have been reached.
- Sustainability of regional institutions and cooperation structures established with support from the projects.
- The quality the design and management of the support programmes, including the logframes, risk assessments, monitoring and reporting of project deliverables, dialogue and ability to adapt to new knowledge, changing circumstances or needs.
- Cross-cutting issues that is relevant to the Programme, in particular gender equality and gender reporting, as well as environment and climate change.
- If and to what extent the programmes have contributed to improved availability and affordability of electricity in the regions, including any evidence to suggest if harmonisation of national planning and operations of the electricity sectors or regional power trade contribute to increase reliability, quality, affordability of electricity or reduced tariffs and costs.
- If and to what extent the regional cooperation has facilitated the implementation of environmental objectives as boosting renewable energy production, introducing environmental assessment procedures for power development etc.

In considering key lessons, the review shall compare the experiences in EAPP and SAPP as well as other regions (including the Nordic region), and discuss the following questions:

- Timing and purpose of trading mechanisms: On what trading solutions should the emphasis be, and at what time should the piloting or establishment of more advanced (than bilateral) trading mechanisms be an aim for the support? What should be the specific aims in terms of improving system efficiency and reliability, and how is this best measured? How to ensure a holistic approach to this on a cross-pool basis ensuring that investments and experience done in one pool is efficiently shared with the other(s)?



- Planning: What regional and national planning functions needs to be in place, and what is the optimal integration between these two planning levels.
- Institutional capacity building: What are the key regional functions needed to harmonise standards and operations of the electricity sector? What are the most important conditions or prerequisites that facilitate institutional capacity building at the regional level. How to achieve a consistent approach and allow for more cross-pool sharing of knowledge, experience and systems.
- What commitments, capacities, conditions or prerequisites need to be in place at the national level for regional power trade to happen? What is the ideal process or recommendations to facilitate the required changes?
- By what means can regional power trade organisations best push realisation of investments that establish critical/priority infrastructure for regional power trade. What could be the role of donor organisations?
- If and to what extent has the support facilitated a more gender-oriented scope of regional energy projects.

Informed by the assessment of results/achievements and discussion of key lessons the review shall contribute to the drafting of a more elaborate and generic Theory of Change (ToC) for development support to regional power trade. The ToC shall consider the relevance towards international environmental/climate change goals (Paris Agreement on CC) as well as goals related to achieving social and economic impacts from electrification (SDG no 7).

#### **4. Methodology**

The assignment will be implemented through desk studies of relevant documents and interviews with key stakeholders at regional and national level.

Further details on documents and stakeholders in annex II.

#### **5. Qualifications**

Three international experts with experience from at least one of the regions and documented qualifications in:

1. Evaluation and/or ex post reviews of capacity building projects
2. Economic aspects of regional power trade and infrastructure development (comprehensive understanding of economic merits of power exchange and investments in cross-border infrastructure, preferably from a power utility perspective).
3. Formal and technical aspects of regional power markets (comprehensive understanding of political, technical and legal issues involved in developing the framework for power trade, and the development and operation of competitive power pools.)

Up to two local experts with comprehensive knowledge of regional power cooperation in the respective regions, as well as national power sector priorities and institutional set-up relevant to at least a couple of the member states' practical participation in power trade.

The proposed team leader for the review needs extensive team leader experience, including in evaluation and/or ex post reviews of capacity building projects.

## **6. Reporting**

A short Inception Report shall be submitted within two weeks after the contract have been awarded and shall propose a more detailed methodology responding to the purpose and scope of this joint review, including:

- Preliminary findings and further research question based on a desk study (preliminary read of) of relevant documents
- Identify areas with need for further documentation additional information
- Plan for interviews, including a proposed shortlist of selected key stakeholders and informants at national and regional level
- A detailed work plan with a proposed itinerary for the field trip, deadlines for reporting and a budget for the implementation phase of the review.

A draft final report shall be submitted to Norad, Sida (HQ and Embassy of Sweden in Addis Ababa), and the Norwegian Embassies in Addis Ababa and Maputo for comments. Norad will coordinate comments to the draft report from all involved parties.

The main report should preferably not be longer than 50 effective pages.

**Annex I**

**EAPP (Phase II) and SAPP (Phase III) SUMMARY RESULT FRAMEWORK**

Power Pool	Inputs	Outputs	Indicators	Goal and Purpose
EAPP (Phase II)	<ul style="list-style-type: none"> <li>- Technical assistance and consultancy services</li> <li>- Software</li> <li>- Funds to recruit personnel</li> <li>- Training (local and overseas)</li> <li>- Computers</li> <li>- Communication costs</li> <li>- Stakeholder meetings</li> </ul>	<ul style="list-style-type: none"> <li>- Operationalize the CC and IRB</li> <li>- Operationalize the regional grid code</li> <li>- Create and operationalize working groups for regulation, planning and operation of the regional power system</li> <li>- Implement and build on the management consultancy inputs</li> </ul> <p>(Referred to as "Purpose" in the agreement)</p>	<ul style="list-style-type: none"> <li>- Trained and experienced staff of the CC and IRB</li> <li>- Approved procedures/guidelines for working groups, CC and IRB</li> <li>- Study documents (on harmonization) that identify and address gaps in national regulations that affect power trade</li> <li>- Study documents relevant for the establishment of work groups</li> <li>- Workshops with stakeholders to discuss study recommendations</li> <li>- Concrete measures on harmonization taken</li> <li>- Working groups approved and formally established</li> <li>- New staff rules and organizational structure approved and implemented</li> </ul>	<p><u>Goal</u> To provide efficient and effective market operation and system operation coordination and regulatory services for the regional power market</p>
SAPP (Phase III)	<ul style="list-style-type: none"> <li>- Technical assistance and consultancy services</li> <li>- Software</li> </ul> <p>SAPP to provide:</p> <ul style="list-style-type: none"> <li>- Project management and logistics</li> <li>- Office space</li> <li>- Other required facilities</li> </ul>	<ul style="list-style-type: none"> <li>- Implementation of priority regional generation and transmission projects</li> <li>- Transparent rules for access to transmission facilities</li> <li>- Working, clear and transparent transmission pricing strategy</li> <li>- More players</li> <li>- Increased trade volumes</li> <li>- Working Balancing and Ancillary Markets</li> </ul>	<ul style="list-style-type: none"> <li>- Increased DAM share (5% by end 2015)</li> <li>- Increased participants in DAM (at least 10 by 2015)</li> <li>- DAM system revenues generated adequate (at least 100% of DAM costs)</li> </ul>	<p><u>Goal</u> Least cost environmentally friendly affordable energy and increased accessibility in the region</p> <p><u>Purpose</u> Implement an efficient regional spot market</p>

**Annex II****Documentation and stakeholders (to be further detailed)****Documentation**

- Project documents
- Appraisals
- Decision documents
- Contracts, both country agreements and between implementation partners
- Annual reports including audits and minutes of annual meetings
- Minutes from member state (Steering Committee and Conference of Ministers) meetings
- Previous Mid Term Reviews (both programmes)
- Any other EAPP documents as might be of relevance or interest related to the Review
- Road Map for development of the power trade within EAPP
- World Bank appraisal document for AREP
- Master Plans for the two entities (EAPP and SAPP)
- Other...

**Stakeholders**

- SAPP and EAPP regional institutions (CC, IRB, NELSAP...)
- Relevant intuitions (ministry, utility, TSO and regulator) in a selected number of member (either directly or by telecom, as determined during inception)
- Development partners...
- Potential private investors in the power sector?
- Other stakeholders?

## 11.4 Appendix 4: Comments on the Draft Report

This appendix documents the comments received from various parties, with the authors' response to each comment in ***bold italic text***.

### 11.4.1 Comments received from EAPP (on 08 February 2019)

#### General comments:

- 1) The NORAD support to EAPP commenced in 2009 and ended 2014 under two support programs. In both cases, EAPP implemented both programs successfully and submitted completion reports to NORAD and were reviewed and approved. The current assessment has not comprehensively considered accurately all the achievements and impacts of the two programs, as well as the current steps taken by EAPP towards creating a regional power market.

***Authors' response: The scope of the review was on the Phase II support to EAPP.***

- 2) The report is mainly based on views or opinions which in most cases do not represent the actual situation. For any report to be credible, it needs to be backed up with sufficient data and observations. For instance, on page 36, the authors just mentioned that "some of the roles and responsibilities of the IRB were vague and needed clarification". In this case, the author was supposed to cite at least one or two, out of eleven (11), roles and responsibilities which are vague.

***Authors' response: The review is based on interviews with role players and review of documentation. The unclear role of the IRB has been mentioned by several interviewees, which indicates that EAPP (and IRB) needs to enhance its information dissemination drive.***

- 3) The report was prepared based on information and documents in addition to certain visits made by the reviewers to 3 EAPP countries in addition to interviews conducted throughout the visits. Based on the questions made by the reviewers, the adequate answers were given, however, the report seems lacking sufficient or further explanations regarding several aspects.

***Authors' response: We have assumed that these aspects are included in the specific comments below and have addressed them there.***

- 4) Generally, the scores given to EAPP against the indicators are not fair. The indicators defined and the assessment are in some areas not well compared. The assessment made on some indicators are mutually exclusive and all the tables regarding EAPP assessment should be reviewed. Surprisingly only negative aspects were considered against the indicators.

***Authors' response: The assessment by indicators highlights both positive and negative aspects. More specific information will be required to address EAPP's concerns.***

Specific comments:

No	Page	Issue	EAPP Comment	Authors' Response
1	9	While EAPP's technical capacity has developed, there is a lack of "visionary leadership"	<p>"Visionary leadership" - What is meant by this statement?</p> <p>EAPP has put in place a very well defined Road Map, Ten Year Strategic Plan and a Three Year Action Plan accepted by all stakeholders. EAPP is currently working towards achieving these goals.</p>	<p><b><i>The authors stand by their statement on lack of visionary leadership. Had there been visionary leadership, EAPP would have transformed shadow trading into live trading immediately after the twinning arrangement came to an end and achieved some significant benefits (both financially and in terms of experience). The Road Map, 10-year strategic plan and 3-year action plan do not focus on getting live trading going, which in our view is the most important immediate milestone to be achieved by EAPP.</i></b></p>
2	26	The <b>Independent Regulatory Board ("IRB")</b> is constituted of nominees of national energy regulators in EAPP member countries. Steered by the policy decisions of the COM and deriving its authority from the IGMOU, the IRB imposes the regional market rules and grid code upon the EAPP participants. Its key responsibilities include a) monitoring and surveillance of regional market development, b) enforcing adherence to the rules (standards, procedures and specifications), c) setting regulated tariffs and wheeling charges for regional transmission interconnectors, and d) arbitrating disputes related to power exchanges and transactions within EAPP.	<p>This is directly copied from old reports and does not reflect the existing approved IRB mandates which were provided to the Authors during the survey.</p>	<p><b><i>The descriptions of the various EAPP organs under the organisation chart are meant to be of a summary nature, and not list every single role and responsibility. The key roles of IRB are still valid. Besides, no document listing the 11 mandates has been shared with us. What we have is the EAPP Organizational Manual (which does not have a date) that lists 12 roles and responsibilities for the IRB.</i></b></p>

No	Page	Issue	EAPP Comment	Authors' Response
3	36	<p>Section 6.1. EAPP Goal,</p> <p>The overall finding is that the high-level objective of trading was not achieved despite delivery of many outputs and activities. A key reason for this is lack of a political leadership within EAPP and its members.</p>	<p>The link between EAPP Goals and the program goals are represented differently in the report and should be corrected.</p> <p>This conclusion that (“A key reason for this is lack of a political leadership within EAPP and its members”) is misplaced and not justified through the assessment of the performance indicator. It should not even fall under this section 6.1. EAPP Goal.</p> <p>Is the section 6 “ <b>Assessment of main results and achievements</b>” related to the summary of findings, if so, please clarify the title and add that it is a summary of findings.</p>	<p><b><i>What we understand EAPP questioning here is ‘the high-level objective of trading’ which is not specifically mentioned as a goal. We interpret the goal of ‘efficient and effective market operation’, however, to encompass trading. Without trading there is no operational market.</i></b></p> <p><b><i>The authors thus stand by their assessment.</i></b></p>
4	36	<p><i>Table 12: Results Framework for EAPP Goal.</i></p> <p>EAPP members have not really understood (or are aware of) the opportunities and benefits of short-term trading that are achievable on existing interconnectors. It appears that members are under the impression that short-term trading is only possible once a fully interconnected system is in place.</p>	<p>This is not correct at all and the score is unfair.</p> <p>The Authors didn’t carry out enough study/survey to enable them come up with such a conclusion. EAPP is on the opinion that such a conclusion could have only been arrived at, if the Authors carried out a survey on the countries that participated in the pilot trade which was not done.</p>	<p><b><i>The authors stand by this conclusion, on the basis of live trading not having been implemented despite shadow trading yielding compelling evidence that it would be very beneficial to do so. If this was well understood up to decision -making level, it would surely have been implemented.</i></b></p>



No	Page	Issue	EAPP Comment	Authors' Response
5	38	<p><i>Table 13: Results Framework for EAPP Purposes</i></p> <p>The role and responsibility of the IRB appears unclear</p>	<p>This is not correct, the IRB has its clear mandates well defined and approved by COM. Score given is not fair (see general comments and what is mentioned above on page 26).</p>	<p><b><i>The relevant paragraphs in Table 13 and Section 6.2.1 have been reworded to correctly reflect that the IRB roles and responsibilities are clearly defined in the EAPP Organizational Manual.</i></b></p> <p><b><i>The statement that IRB is not able to fulfil its function due to lack of resources is applicable, however. Also, in the absence of power exchanges between members the IRB has no role to play and can therefore not be deemed to be an 'operating EAPP organ'. The score of 2 (unsatisfactory) is therefore maintained.</i></b></p>
6		Lack of political commitment of members	<p>It is quite inadequate to mention this, EAPP members established the organization 14 years ago and are continuously discharging their responsibilities since then. It is worth mentioning here that unprecedented significant arrears were collected this year which show political integrity.</p>	<p><b><i>The context of this statement matters. Without any reference (page number, section number) given it is not possible to comment meaningfully.</i></b></p>
7	23	<p>The EAPP Interconnection Code ("IC"), also referred to as Regional Grid Code, which provides the rules and standards for technical planning and operation of the EAPP Interconnected Transmission System. This exists in draft form as COMESA Harmonized Standard.</p>	<p>The Grid Code does not exist in draft form; EAPP has a final version approved by Council of Ministers. The grid Code Compliance GAP analysis has been conducted for five countries under the support of Power Africa. This is still an ongoing activity with the current World Bank Support under Operational readiness.</p>	<p><b><i>Our notes do not reflect this, and the approved grid code has not been shared with us.</i></b></p>

No	Page	Issue	EAPP Comment	Authors' Response
8	36 - 47	Market Assessment	<p>EAPP does not agree the fairness of market assessment. Some key components and language need to be addressed or changed as it is not accurate.</p> <p>“Market Sub-Committee for power trading has not yet been created as intended. The reasons given included that there is currently no need for such a committee due to a lack of trading and that trading matters could so far largely be taken care of by the Operations Sub-Committee”</p> <p>The correct position is that the Twinning services were supposed to recommend the setup, roles and mandates of the Market. A solid proposal was then supposed to be recommended for adoption to the SCM. The EAPP understands that the Market committee is required urgently to spearhead market activities and even established a market working group which is awaiting entrenchment the EAPP wide organogram with approval of the SCM.</p>	<p><b><i>The relevant paragraph in Section 6.2.3 has been reworded to reflect ‘the correct position’.</i></b></p> <p><b><i>However, it does not materially change our assessment of the market development component.</i></b></p>

No	Page	Issue	EAPP Comment	Authors' Response
9	40	EAPP leadership appears unaware that live trading is indeed possible on the existing interconnectors (Sudan- Ethiopia and Kenya- Uganda) as was evidenced by the shadow trading exercise...	<p>This exercise was carried out with full approval of the EAPP management as well as EAPP steering committee and this is incorrect.</p> <p>The fact is that EAPP is working on Commercial Readiness activity to ensure the power trade becomes a reality.</p>	<p><b><i>While it is important that EAPP is working on 'Commercial Readiness activity' the demonstrated benefits that would have resulted from immediate live trading with existing tools have been missed out on. Rather than at that stage ceasing to trade and focussing all attention on 'Operational Readiness', i.e. development/implementation of the 'required legal, technical and operational systems', EAPP could pro-actively have engaged with the utilities of Sudan, Ethiopia, Kenya and Uganda to transform shadow trading into live trading, on the same basis as the successful shadow trading. The outcome would have been 4 additional years of valuable market operation experience that would also have contributed to speeding up operational readiness.</i></b></p>
10	45	The failure to continue shadow trading, and expanding it to live trading, is ascribed to a lack of leadership and vision in the EAPP GS and Steering Committee.	<p>This statement is incorrect. There are several factors that delayed the conversion of shadow trade to real trade. This can be attributed more to technical (Operational Readiness) issues than leadership.</p> <p>EAPP is now undertaking activities related to operational readiness (OR).</p>	<p><b><i>The mentioned statements in Sections 6.3.1.1 and 6.3.3 have been reworded, with emphasis on questioning why EAPP management and SC have not taken a more pragmatic stance towards commencing live trading immediately after shadow trading ceased 4 years ago.</i></b></p>
11	46	The understanding of trading opportunities and benefits appears low at policy and decision-making level and more effort is required in this regard.	<p>This is more a personal view of the consultant than the reality.</p> <p>The Policy mandate for EAPP rests with the COM. The SCM implements directives of the COM. The COM policy as per the last COM (13<sup>th</sup> COM) in February 2018 was to ensure that the required, legal, technical and operational systems are in place for EAPP members to start trading.</p>	<p><b><i>The mentioned statements in Sections 6.3.1.1 and 6.3.3 have been reworded, with emphasis on questioning why EAPP management and SC have not taken a more pragmatic stance towards commencing live trading immediately after shadow trading ceased 4 years ago.</i></b></p>

No	Page	Issue	EAPP Comment	Authors' Response
12	48	7. COMPARATIVE PROGRAM REVIEW	<p>Why this section is comparing the two institutions (EAPP and SAPP) which are at different level of maturity related to power market?</p> <p>Each institution should be evaluated against its own KPIs separately according to the package of the Programs and expected results. Therefore, this should be separated.</p>	<p><b><i>The comparison is of the overall support program performance in terms of the OECD/DAC criteria of relevance, effectiveness, efficiency, impact, sustainability and cross-cutting issues. This was part of the terms of reference.</i></b></p>

#### 11.4.2 Comments received from SAPP (on 15 February 2019)

- 1) Item 5.3.2 on page 31 states that SAPP and SAEP are working on a new membership criteria. The revision of SAPP's membership criteria is being made by SAPP through its sub-committees and the Legal Working Group with no input from SAEP as such we do not see why it is mentioned. The reference to SAEP in Table 6 should therefore be removed as well.

**Authors' response: Done.**

- 2) In item 5.5 there is reference to a joint effort with SAEP to bring in IPP. SAPP is working alone to do this and again does not see the need for such references.

**Authors' response: Reference removed.**

#### 11.4.3 Comments received from Norad (on 07 March 2019)

##### General comments

- 1) The role of bilateral trade

Bilateral trade through long term PPAs, in some cases with third party wheeling arrangement, has been and will continue to be important for financing of regional infrastructure. In both SAPP and EAPP markets bilateral trading volumes outsize trading on other platforms. Bilateral trading is discussed several places in the report, predominantly when assessing market developments in SAPP and the need to replace, convert or change priorities from bilateral contracts to multilateral trading platforms.

Depending on stage of development or maturity of trading arrangements the role of regional trading organizations can shift from being facilitative to being suppressive of bilateral trade. Currently USAID/Power Africa is supporting EAPP to facilitate bilateral trade though developing standard/template PPAs and wheeling agreements that can make upcoming bilateral negotiations less arduous.

- To avoid unnecessary dichotomy between bilateral and multilateral trading arrangements it would be helpful if the review report could incorporate a more systematic view on the role of bilateral trading arrangements and at least contextualize the development (explain the value added) of multilateral trading arrangements towards parallel bilateral trading arrangements.
- This would have implications for several chapters in the draft report, including SAPP Assessment/Market development (chapter 5.1), EAPP Assessment/Goal and Purpose (6.1 and 6.2) as well as ToC/Outputs (10.1 – should emphasis be on enabling environment and/or volumes traded?).

**Authors' response:**

***a) Additional text added in section 5.1 to provide better context for SAPP where market-based multilateral trading is playing an increasing role.***

***b) Paragraph added in section 6.1 to provide context for EAPP, where market-based trading is non-existent at this stage.***

***c) ToC/Outputs (10.1) Enabling environment is the output in the presentation of the ToC. Trade volume is an intermediate result/ low outcome in the ToC presentation.***

## 2) Pros and cons of EAPP political set up

At the EAPP meeting in Entebbe it was felt that EAPP is dysfunctional in engaging energy ministers in technical and operational trivialities, and Development Partners encouraged to reconsider the organizational set-up as an adaptation to developments and evolving needs.

With the COM (and perhaps also IRB) EAPP is a more “political” organization than SAPP. It can be regarded as a benefit that SAPP emphasize cooperation at utility level and avoid unnecessary political interference. Political support is obviously needed for power trade to happen. But what is the merit of trying to solicit political engagement and support through the EAPP compared to the SAPP governance systems, and can you make any further observations, recommendations or at least further research question to the governance set up of regional power trade organizations?

***Authors’ response: What differentiates the SAPP from the EAPP is the more pro-active role that the SAPP Coordination Centre plays in engaging power pool members and coordinating activities. This is of course assisted by a functioning trading platform and related market mechanisms in SAPP. With EAPP not yet having reached a similar level of market maturity, it is perhaps understandable that political ambitions of individual member states come to play as members jostle for position in the emerging power market. Changing the governance structure to de-politicize the EAPP will in our view not yield the desired results. Rather, emphasis should be placed on commencing to trade where possible, even if the opportunities are few at this stage and the volumes low, so that the focus shifts away from politics and stakeholders can see the benefits themselves. Trading could proceed on the Ethiopia-Sudan and Uganda-Kenya interconnectors and does not have to wait until all organizational obstacles are resolved.***

## 3) Theory of Change Recommendations

The set up and intervention logic proposed is familiar and sound, but this chapter separates itself from the rest of the draft report as less detailed or thorough. We would like to get back to a more extensive discussion on potential improvements. Some tentative and immediate suggestions for consideration would be:

- Consider expanding outputs and intermediate outcomes to include infrastructure and bilateral trade

***Authors’ response: The ToC figure has been updated in Section 10 and the executive summary, to reflect hard infrastructure. Also, tables 10.1 and 10.2 in the ToC have been updated for bilateral trade.***

- Recommend key objectives and indicators: Effective power trade could be the most important objective. This could be measured in traded volumes, but also other tangible benefits reduced costs, improved quality, saved investments/shared reserves. Please also advise on other relevant indicators for the different outcome levels.

***Authors’ response: Key objectives and indicators have been incorporated as section 10.4 in the ToC.***

- Expand on assumptions (also commented by Sida)

***Authors’ response: Expanded and included reference to Sida supported papers under assumptions in ToC (section 10.3). The finding from this review supports the earlier work funded by Sida, and they complement each other.***

Specific comments

No	Page	Issue	Norad Comment	Authors' Response
1	8 and 49	<p>“Another potential area for improvement in the SAPP revolves around the adoption and implementation of new trading rules. The reason is that a rule change usually ends up benefiting some members while disadvantaging others. The group that stands to lose will naturally resist any rule change resulting in delays, compromises and, in some instances, no rule change at all. Such delays not only hamper market progress but also impede on market efficiency. The ‘rule-conflict’ problem can also be observed in other areas of the market, for example more efficient transmission pricing arrangements and even allowing SAPP membership.”</p>	<p>This is an inherent problem where essentially all countries have one utility being responsible for everything. Implementing some kind of “unbundling” could help (however, not very easy or at all on the agenda). Another thing that could help would be the opening of the market to other parties that would push these double roles into the open</p>	<p><b><i>Since the submission of the draft report the Consultant became aware that SAPP has started to address some of the issues. For example, SAPP introduced a two-tier approach to SAPP membership. The new arrangement allows for IPP membership without all the responsibilities associated with utility membership. This should reduce the administrative and cost burden on potential IPPs that want to participate in the market.</i></b></p>
2	8 and 49	<p>“The SAPP markets can be made significantly more efficient by giving financial traders access to the physical markets.”</p>	<p>It may be more efficient to open the physical market for more parties. Difficult to envisage any other pure financial traders participating in markets where the price formation is with a few market participants</p>	<p><b><i>Agreed. The report already advocates for more membership (including private players) not only on the supply side but also on the demand side.</i></b></p>
3	8 and 49	<p>“Consideration should be given to clearly separating the market functions to ensure independence and fairness.”</p>	<p>Agree, but how far? Could/should the market operator still be kept within the SAPP governance model?</p>	<p><b><i>We agree that SAPP is presently fulfilling too many roles which dilutes resources and creates conflicts. However, more detailed analysis is required to determine those roles that should be separated out. This is out of scope for this assignment.</i></b></p>

No	Page	Issue	Norad Comment	Authors' Response
4	10 and 59	Key support tasks listed for role players to support the prioritisation and development of regional power infrastructure investments	<p>Good long list of recommendations! Possible additions to consider:</p> <ul style="list-style-type: none"> <li>a. have a donor-funded “default fund” (well-known from other markets as well) to increase security</li> <li>b. discuss “sand-boxing” to test access from IPPs into the market</li> </ul>	<b><i>Incorporated in list of key support tasks in sections 1.2.2 and 8.2.2.</i></b>
5	11 and 60	<p>Key support task for Development Partners:</p> <ul style="list-style-type: none"> <li>• “Good coordination of development partner programs to avoid overlaps, duplication and conflicts”</li> </ul>	Could be so easy, but need to be emphasised	<b><i>Already incorporated in list of of key support tasks in sections 1.2.2 and 8.2.2. Slightly reworded to make it clearer.</i></b>
6	12 and 62	“A regional investment vehicle such as the ‘trans-border investment body’ in the West African Power Pool could be considered to fast-track the development of regional power projects.”	<p>Pls provide some documentation on the existence of a WAPP “transborder investment body”?</p> <p>The WAPP 2016-19 Business Plan (draft dated October 2015, section 4.3.2, page 40) mention that the experience from such ad hoc or project structures shall be evaluated:  <a href="http://www.ecowapp.org/sites/default/files/2015-2019_business_plan.pdf">http://www.ecowapp.org/sites/default/files/2015-2019_business_plan.pdf</a></p> <p>Very interesting of they have established such a structure.</p>	<p><b><i>We have tried to research the operations of the WAPP Transborder Investment Body but have not found any reference to this process on the internet.</i></b></p> <p><b><i>We suggest, therefore, that this option is included in a separate assignment to assess how to improve or support regional investments.</i></b></p>



No	Page	Issue	Norad Comment	Authors' Response
7	13 and 65	<p>Timing and purpose of power trading mechanisms:</p> <ul style="list-style-type: none"> <li>“Shadow trading may be beneficial for new member utilities who join the power pool and have not been exposed to short-term trading before.”</li> </ul>	<p>Agree as a general lesson learned, but can be misunderstood to an emphasis now. The focus now should rather be on simple market based real trading with small volumes, and make sure other utilities get involved.</p>	<p><b><i>The last paragraph in section 8.4.1 been reworded to emphasise that shadow trading needs to progress to live trading timeously.</i></b></p>
8	15 and 68	<p>Key recommendation for SAPP:</p> <ul style="list-style-type: none"> <li>“To empower SAPP with more decision-making autonomy regarding the realisation of priority regional power projects (some lessons in this regard may be drawn from the West African Power Pool).”</li> </ul>	<p>Ref. comment above regarding this experience in WAPP.</p>	<p><b><i>Due to lack of publicly available information on the internet about the WAPP model, we suggest that such an evaluation forms part of a separate assignment.</i></b></p>
9	15 and 69	<p>Key recommendations for EAPP - general</p>	<p>Emphasis on exploiting the SAPP experience could be even stronger.</p>	<p><b><i>The relevant section in the table under section 1.3 has been reworded to emphasis this.</i></b></p>
10	15 and 69	<p>Key recommendations for EAPP:</p> <ul style="list-style-type: none"> <li>“To immediately implement measures that will enable commencement of live trading on the existing interconnectors (Sudan-Ethiopia and Uganda-Kenya), which include             <ul style="list-style-type: none"> <li>... using the ADAM as the trading platform”</li> </ul> </li> </ul>	<p>I would rather say that they should get the SAPP MTP as soon as possible to start using this instead of ADAM.</p>	<p><b><i>The relevant sections (first bullet of section 8.2.2 and last paragraph in section 8.4.2) have been reworded.</i></b></p>

No	Page	Issue	Norad Comment	Authors' Response
11	15 and 69	<p>Key recommendations for EAPP:</p> <ul style="list-style-type: none"> <li>“To empower EAPP with more decision-making autonomy regarding the realisation of priority regional power projects (some lessons in this regard may be drawn from the West African Power Pool).”</li> </ul>	Ref. comment above regarding this experience in WAPP.	<b><i>Due to lack of publicly available information on the internet about the WAPP model, we suggest that such an evaluation forms part of a separate assignment.</i></b>
12	38	“We believe that a dedicated Market Sub-Committee could have greatly enhanced the progress towards physical trades on existing interconnectors over the past 3 years since the twinning arrangement ended.”	Pls substantiate.	<b><i>More context added in the second paragraph in section 6.2.3.</i></b>
13	38	<p>Results framework for EAPP purposes:</p> <ul style="list-style-type: none"> <li>“The role and responsibility of the IRB appears unclear and it is not able to perform its function due to lack of resources.”</li> </ul>	Pls expand/clarify (ref. description of IRB set up and mandate on page 23) what is unclear with the role and responsibility of IRB.	<b><i>The relevant paragraphs in Table 13 and Section 6.2.1 have been reworded to correctly reflect that the IRB roles and responsibilities are clearly defined in the EAPP Organizational Manual.</i></b>
14	42	<p>Results framework for EAPP institutional development component:</p> <ul style="list-style-type: none"> <li>“To which extent a critical mass has been reached is uncertain.”</li> </ul>	Unclear language, pls explain/substantiate.	<b><i>Sentence reworded in Table 14 first row.</i></b>

No	Page	Issue	Norad Comment	Authors' Response
15	43	<p>Results framework for EAPP planning component:</p> <ul style="list-style-type: none"> <li>“How realistic some of the assumptions, such as the demand forecast, are is uncertain, but some countries such as Ethiopia and Kenya appear to use the regional plan as an input to their in their own national plans.”</li> </ul>	<p>Guess a score of 4 is fair if you look at the update of the plan as an isolated indicator. Should not the very limited uptake in national planning be reflected in a lower score? NB Quality aspects could be followed up the key lessons/recommendations in chapter 8.1</p>	<p><b><i>The Review Team thinks that a score of 4 (moderately satisfactory) is reasonable. The Master Plan has been updated (an output). Use of the master plan by some members in national planning is more of an intermediate outcome.</i></b></p>
16	57	<p>Regional planning vs national planning:</p> <ul style="list-style-type: none"> <li>“To add value to national planning as well as project feasibility studies the regional planning could take a more independent and comprehensive view of national demand projections and regional trading potentials.”</li> </ul>	<p>Previous findings substantiate such an observation. Pls consider specific recommendations to enhance the quality of regional planning.</p>	<p><b><i>We have added a paragraph in this regard in section 8.1.1 and a recommendation in section 9.3.</i></b></p>

#### 11.4.4 Comments received from Sida (via Norad on 07 March 2019)

Thanks for the opportunity to give comments on the report. Sida has reviewed it. These comments come from Sida HQ and Swedish Embassies concerned with support to energy trade has been consulted.

##### General comments

- 1) The analysis in the report is of high quality, coupled with clear lessons learned and very workable and concrete recommendations and suggested actions. The suggested Theory of Change presented on page 70-71 is usable but also points on some of the challenges in building political support for de facto regional cooperation, such as assuming political will and existence of conducive macroeconomic conditions (i.e. a market economy).

**Authors' response: No response required.**

- 2) Having said that, the analysis could have been further sharpened by expanding on the aspects of the political economy as a game-setter for the support/lack of support for regional trade. This feature is particularly obvious for EAPP, but is, to some extent, also valid for SAPP. I attach a report from ECDPM (2016), with the title *"The political economy of regional integration in Africa – Synthesis report - What drives and constrains regional organisations?"* which was commissioned by Sida in 2015 in the preparation for the present regional strategy. The report is highlighting the following aspects;
  - i. Implementation of regional initiatives takes place when they are in line with key 'national interests' as defined by the ruling elites rather than from economic reasons. It is obvious when comparing the Eastern Africa Power Pool (EAPP) under COMESA and the Southern African Power Pool (SAPP) under SADC. Progress in the EAPP is affected by where Ethiopia sees its interest. This also goes for South Africa's role in SAPP, where energy import once was an important driver for regional trade. This seems now to have been shifted into the drive of RSA exports of surplus energy. This could however change quickly, if the mining industry recovers through increasing world market prices on minerals.
  - ii. Patterns of natural resource distribution can incentivize regional engagement but can also generate tensions between members of the power pools. In eastern Africa, Ethiopia's significant water resources have been important in shaping the current incentive environment for EAPP. Ethiopia seeks to exploit its water resources to become a major exporter of hydroelectric power to other countries in the region, providing a rationale for a regional power market in eastern Africa, but also giving Ethiopia a strong incentive to exercise control over the EAPP. Ethiopia's construction of the Great Ethiopian Renaissance Dam has fueled tensions with Sudan and Egypt, who fear that such developments in the Nile River basin will negatively affect their supply of fresh water. This agenda for extending political powers also triggers counter-actions from other members of the pool to avoid political influence and to avoid being vulnerable to political pressure. This points at the scarcity of political trust between the countries. Other countries in Eastern Africa only pays lip-services to regional trade as they see more political prestige in national energy production than in cheaper, but less visible and riskier, energy trade.
  - iii. Ethiopia's role in EAPP, is an important illustration of the importance of national political interests over regional commitments. Ethiopia's position is influenced by its domestic political objective of maintaining control over market opening as well as increasing influence (both economic and political) at a regional level. Thus, while Ethiopia perhaps stands to gain in the long-run from EAPP and has therefore worked to be in a strong position in terms of how the EAPP functions, it is not politically ready to open its national energy sector to regional competition, hindering the progress that EAPP might make if all other countries were aligned behind its agenda. The Ethiopian

government rather engages in a multitude of bilateral agreements with neighboring countries on energy trade to achieve some of the potential benefits of regional integration without subscribing to a breadth or pace that is at odds with the political regime's vision of development and current perceived interests.

***Authors' response: We generally agree with the quoted excerpts from the ECDPM report that highlight the influence that the stronger economies exercise over power pool developments for their own national interests, which is counter-productive to building trust in an emerging power market. The preference for long-term bilateral contracts, however, is a natural consequence of member states striving to safeguard energy security in the absence of a well-functioning power market on the one hand, and the monopolistic mindset of national utilities on the other.***

- 3) It could be questioned why Zambia, as being one of the core "transmission" countries in the SAPP area, not has been visited during the field-visits of KPMG. The Zambia case shows that the poor statue of the national utility with subsidized tariffs and poor economy is one of the main impediments for implementation of commercially viable (regional) projects. There is a discrepancy between the ambition to trade energy at market prices and the subsidized national tariffs, which skews the markets and promote energy export and hampers energy import.

***Authors' response: We agree with the comment that subsidized tariffs in Zambia are a main impediment to the development of commercially viable projects. Zambia is addressing this issue and attempts have been made to increase tariffs. Another major obstacle is the current market structure in Zambia that requires all IPPs to sell their output to ZESCO which is not a bankable off-taker – this situation is not unique to Zambia. Viable projects would benefit from market restructuring that allows developers to sell directly to large customers and export power. Namibia is taking significant steps in this regard, with partial opening of the market expected later in 2019.***

***Additional text relevant to this has been added in Section 5.2.***

- 4) The Zambia case can be generalized to many countries in Eastern and Southern Africa, where political pressure for subsidized electricity combined with mismanagement of public utilities have prevented cost-reflecting tariffs, which in turn has contributed to historical underinvestment in generating capacity, resulting in limited capacity to trade on a regional market.

***Authors' response: As noted above the general lack of investment in generation and transmission capacity can partly be attributed to subsidized tariffs but are also a consequence of other factors such as the poor credit worthiness of the national utilities as off-taker. All countries would benefit from opening-up their markets to allow willing buyers to trade with willing sellers via the power pool trading platforms. However, market restructuring in the various countries falls outside the direct influence of the power pools.***

- 5) State-owned monopoly utilities control the generation and transmission of electric power in most countries in the two regions, limiting the potential gains to be derived from power pooling. Thus, while members of the EAPP and SAPP, and especially future electricity exporters, may see the long-term value of developing these power pools, they may prioritize focusing on the development and/or reform of their domestic energy sectors in the short-term. It would have been interesting to get a deeper analysis of the implications with low tariffs in the national electrical charges in the region visavi the market based regional tariffs and fees. Is this hampering regional trade and how could the regional trade support the equilibrium of tariffs in the region and to abolish political set tariffs.

***Authors' response:*** *The points have been addressed in previous comments. In summary, subsidized tariffs are certainly inhibiting the lack of investment in new generation capacity, and opening up the national power markets to competition would introduce new supply and demand options that would stimulate deeper liquidity and better price formation. It is encouraging that several countries - including Namibia, Zimbabwe, Zambia and Mozambique - are actively addressing the issue of electricity prices.*

- 6) A number of the observations indicate a need for seeking comments from the main stakeholders, i.e. the Governments owning SAPP/EAPP, the utilities, and the donors. Maybe a major work-shop with the main stake-holders, also should be held to present and discuss the conclusions. The CoM meetings in the two power pools might be a suitable occasion (February 20-21 in Kampala for the EAPP SC/COM and March 19-20 in Harare for the SAPP EXCO).

***Authors' response:*** *This is out of scope but could be added in a follow-up assignment. Norad had attempted to have the findings presented at the EAPP CoM in February but without success.*

- 7) The scope for using SAPP and EAPP for other regional energy issues such as environment (boosting renewables, energy efficiency), gender, conflict etc. (extended procedures for including analysis of cross-cutting issues in project preparations), could have been discussed as the power pools are one of the few structured collaborations in the energy area at a ministerial level. Some work has also been done within SAPP for developing environmental procedures (although they were not financed from the S/N support), which would have been interesting to know the impact of.

***Authors' response:*** *This has been commented on in more detail in section 8.5 and the executive summary, providing additional observations made during the interview process.*

- 8) The assessment of gender issues is very weak in the evaluation, in spite of explicitly been mentioned in the ToR. The report only indicates no negative impacts above few employed women in the secretariats. If possible, the consultant should be requested to expand on these issues.

***Authors' response:*** *Cross-cutting issues such as gender are not taken into account in planning and implementation in neither of the Programs. At the time of the review, no trading had taken place in EAPP, which makes it difficult and unnecessary to expand further on impacts on women as a result of trading i.e. longer term results such as access to cleaner energy replacing more hazardous energy uses today such as wood fire etc.*

***Additional text has been inserted in section 8.5.1 to expand on gender in staffing.***

- 9) The recommendation that donors should try to coordinate their efforts through a common program, led by one key donor, points explicitly towards using the MDTF as the vehicle for continuous support. However, so far it is only Sweden who supports the MDTF. Not even the World Bank channels their AREP support via the MDTF, which has caused some reporting problems.

***Authors' response:*** *This is ultimately a decision that has to be made by the donors involved. The most important aspect is to coordinate interventions to avoid duplications, overlaps and pulling in different directions, which we have pointed out. Also, the trust fund could be an effective instrument to achieve better coordination among the donors.*

### Comments specifically on SAPP

- 10) The relative success of the SAPP could probably be traced to a combination of conditions in the mid-nineties related to drought, post-apartheid dynamics and surplus production by South Africa's state-owned monopoly producer of electricity. The drive from RSA to expand energy trade (more explicitly import of commercially priced electricity) was probably the key driver behind the success. It would be interesting if the report could expand a bit more on the macro-economic and political drivers for energy trade.

***Authors' response: Additional text has been inserted in section 5.1.4.***

- 11) Increased bureaucracy from the start of PAU is a worrying information, particularly in connection with the (s)low outcome of the work of the unit. Is this related to the role of PAU, the competition between PAU and SAPP CC or lack of interest of the member countries. This should be commented upon by the WB, SAPP and member countries.

***Authors' response: The slow implementation of regional interconnectors is of concern to all interested parties. Based on the comments received from some of the stakeholders it seems that the PAU is finding it hard to accelerate the development of new interconnectors. This is a complex issue because of the many role-players that are involved. We agree with the comment that this should be addressed and commented on by other interested organisations including the WB, SAPP, AfDB, DBSA and of course the member countries.***

***Additional text has been inserted in section 5.2.3.***

- 12) It is worrying that the trading volume in SAPP is going down although trading results are reported very positively. What is the reason behind this trend and what could be done to revert it.

***Authors' response: SAPP Trading volumes are driven primary by the demand and supply imbalances between the countries. For example, when Zambia and Zimbabwe experienced drought condition they relied heavily on SAPP to top up energy supplies. Once waterflow patterns have returned to normal these countries purchased less via the SAPP. It is encouraging to see that countries such as Namibia, Botswana and Mozambique are relying increasingly on SAPP markets to trade any daily surpluses or deficits and we expect trading volumes to increase gradually over time.***

***Additional text has been inserted in section 5.6.1.***

### Comments specifically on EAPP

- 13) The positive assessment of the twinning arrangement is encouraging and might lead to a conclusion that such support often is more flexible, more relevant and cheaper than consultancy procured support. Is that correct?

***Authors' response: It is correct that the twinning arrangement appears to have worked well, especially since EAPP implementation capacity was limited and there was limited follow-up by the donor, but we do not have grounds for concluding that twinning is more flexible, more relevant and cheaper than consultancy procured support.***

- 14) It came as a surprise that it is recommended to invest in a SCADA for EAPP. According to AREP consultants this development is deemed as premature.



***Authors' response: We have removed this recommendation from sections 9.4 and 9.6 as initial trades are expected to be small and restricted to a handful of participants. A SCADA is required once trading volumes become significant.***

- 15) The evaluation has not commented on the complexity of the overlaps of mandates and initiatives between different regional organizations like EAPP, NELSAP and EAC. These conflicts have created further delays and frictions in the development of regional energy trade in East Africa and merit some more analysis.

***Authors' response: The Review Team agrees with the comment, but further analysis of this is beyond the scope of this limited end review – and would be based on existing literature which is available to the donors already.***

#### 11.4.5 Comments received from the Norwegian Embassy in Addis Ababa (via Norad on 07 March 2019)

The Embassy has looked at the joint review to SAPP and EAPP report and we think that it sufficiently captures both positive and negative aspects to EAPP and the comparative review findings reflects almost all the issues with the power pool.

- 1) Minor issue of clarification perhaps is the end date of EAPP. The project was decided to be closed in 2015 after the twinning activity was successfully completed and the verification procedure needed to continue disbursement to EAPP turned out to be negative. The 2017 end-date reflects only the administrative end-date (PTA closure date) but the operation has long been finalized in 2015. This was also reflected on page 53 as lack of dynamism and pro-activeness in program management and governance structure, and perhaps should also be included in the summary to avoid confusion.

***Authors' response: The effective end date of 2015 was corrected in Section 2.1 and Table 20 under EAPP Phase II Support/Efficiency/Weaknesses. It was also included in the Summary on the first page.***

- 2) An addition to the negative aspect, the lack of engagement of EAPP Secretariat with national stakeholders/utilities and their absence from the broader energy space could be added. This also aligns with what is written on page 53 as review assessment of their inefficiency in coordinating and organizing workshops.

***Authors' response: Added in Table 19 and the corresponding table in the summary.***

- 3) On page 56, there is a point that states: “There were cases of mismanagement of funds, so the program had to deal with some issues related to corruption. These were however resolved eventually”. The text is not accurate and we propose the following instead “There were cases of financial system weakness and this was followed by the Embassy. The agreement was eventually completed and closed”.

***Authors' response: Text replaced in Table 20.***

- 4) We would also emphasize the need for restructuring the EAPP Secretariat itself and for having a more transparent system of staff recruitment as a recommendation to key role players.

***Authors' response: These two points were added in section 9.4 and the corresponding table in the summary.***