AFRICAN SCHOOL OF REGULATION

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Renewable generation and regional power trade in Africa

Policy dialogue

Conference Brief

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Contents

1. Objective and background 2

1.1. Regional trade and power pools in Africa 2

2. Organisation and program 4

2.1. The program 5

3. Highlights, findings and actionable decisions. 6

3.1. Regional institutions: Accomplishments, shortcomings, and paths for improvement. 6

3.2. Market rules for efficient operation. 8

3.3. A regional approach to transmission investment and cost allocation. 10

4. The potential contribution of the ASR to capacity building in power trade and other relevant regulatory topics for the African energy sector 13

5. Summary 13

Annexes 15

Annex 1. Position paper #1. The development of African power pools. 15

Annex 2. Position paper #2. Renewable energy and power pools. 15

Annex 3. Position paper #3. Regional institutions of African power pools. 15

Annex 4. Position paper #4. Transmission cost allocation in regional markets. 15

Annex 5. Position paper #5. Regional power trade and bilateral contracts. 15

Annex 6. Topics for debate. 15

1. Objective and background

The Policy Dialogue on Renewable Generation and Regional Power Trade in Africa has addressed the need for strong regional institutions and enabling regulations to harness the potential benefits of regional power trade to meet the continent's acute energy needs.

This brief describes who organised and participated in the Policy Dialogue, succinctly presents its objectives and program, and sums up its findings and takeaways. Several annexes and website links to the conference readings and presentations provide ample information for those interested in going deeper into the topic.

Today, power systems around the globe are more interconnected than ever before. This interconnectivity provides opportunities to reduce the cost of electricity, improve system reliability, increase renewable energy penetration, and take advantage of economies of scales in generation and transmission. Power trading in interconnected systems introduces new regulatory challenges in the regulation of power systems. Regulation of these interconnected systems, while keeping anchored in solid principles, must be adapted to the characteristics of each region and the adopted energy policy – from traditionally regulated power sectors to open competitive wholesale markets. In these two extreme cases and all the situations in between, the goal must be the provision of reliable, sustainable and affordable electricity supply to all customers. This requires performant regional institutions, regulatory and business models that can attract the necessary investment and incentivise good performance by all the agents participating in electricity supply and consumption.

In order to achieve the benefits of interconnection, African countries collaborate by establishing power pools for electricity trade between neighbouring countries and to attract investment in generation plants and transmission lines with a regional perspective. This ASR Policy Dialogue has focused on the regional institutions and the planning and operating procedures that determine the performance of power trade in the African power pools.

1.1. Regional trade and power pools in Africa

Formally organized regional integration of power systems, i.e., regional power pools, can be an effective way to create economies of scale for mobilizing private-sector investments, leverage synergies related to demand and supply and advance economic integration. When properly designed and implemented, regional power pools can lower the cost of electricity supply and improve the quality of delivered electricity services, thereby driving socio-economic development. Power pools provide these benefits when they include regional-scale generation plants and adequate cross-border transmission infrastructure. These prerequisites can only be met under sound power pool rules and governance.

Regional power pools are particularly relevant in the specific context of sub-Saharan Africa, both because the size of the national power system in at least 20 countries in this region is presently below the efficient level of output for a single power plant[1] and because some countries have

[1] This summary has been prepared by members of the ASR. The author of the main document is Ignacio Pérez-Arriaga, Interim Director of the African School of Regulation (ASR). The authors of the annexes are mentioned in each document. Although all effort has been made to represent the presentations made and the opinions expressed by the participants, the only responsibility for the

sufficient renewable resources (e.g., hydro, geothermal, or solar) to not only meet domestic demand but to also export excess power. The capacity of interconnection between neighbouring countries is very low in general. This situation makes impossible to exploit economies of scale in the deployment of generation plants and impedes the efficiency and reliability gains derived from coordinating the operation of the power system from a regional perspective.

Five power pools have been established in Africa – West, East, Central and South in sub-Saharan Africa, which have very different levels of development – as well as the organization coordinating the facilitation of trading of power among five North African countries (Comité Maghrébin de l'Électricité, COMELEC), also in collaboration with several Southern European countries. See Figure 1.

The potential of these power pools remains largely untapped due to technical and political barriers. On the one hand flaws in the rules for regional trading and network cost allocation, which have failed to adapt to the diverse conditions of the African regions the best international practices in the design of business models and regulation. On the other hand, the lack of political commitment and adequate institutions. Effective power pools require a strong alignment of interest among participating countries and external partners, including private entities and financing institutions that are willing to invest in regional infrastructures under the right conditions. National-level political commitment is needed to give executive responsibilities and resources to regional institutions, identify barriers and vested interests that impede progress, and build the capacity to regulate and operate regional systems.

content of this summary is that of its authors. Additional material of interest that was presented during the event can be found on the website of the African School of Regulation https://africanschoolregulation.org.

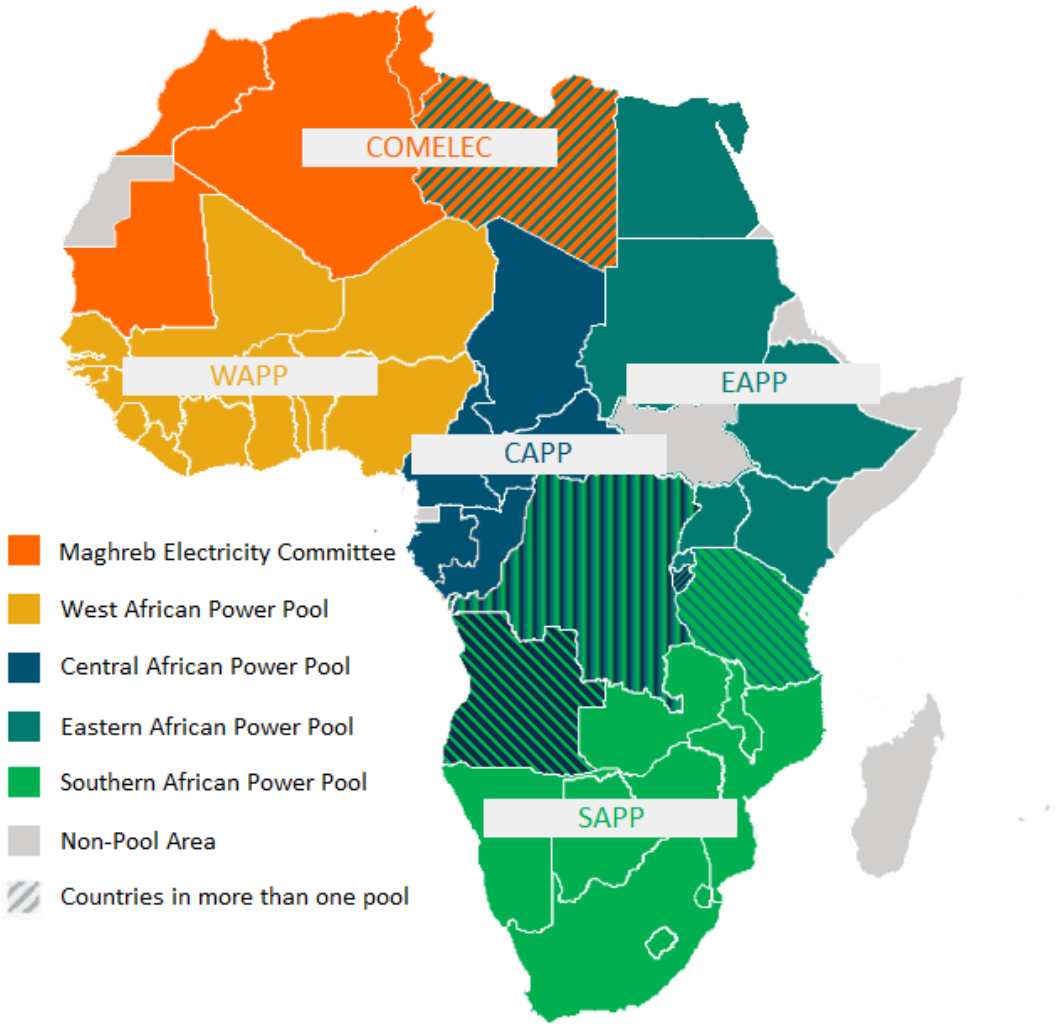


Figure 1. Power pools in Africa.

Both discourage investments in transmission infrastructure and regional-scale generation plants, especially when combined with a lack of trust among states, a lack of willingness to liberalize markets, fear over the preservation of national autonomy and sovereignty and a preference for bilateral contracts over regional agreements. But these are legitimate concerns, and the spirit of the participants in this policy dialogue has been to find a compromise between the reluctance to abandon well-established but inefficient current approaches to investment and operation, and the adaptation and adoption of proven international best practice. The solution seems to be to have a clear vision of the end goal and to find the right pace of change.

2. Organisation and program

This Policy Dialogue was organised by the African School of Regulation (ASR) in collaboration with the Africa-EU Energy Partnership (AEEP), the Tony Blair Institute for Global Change (TBI), REN21, GET.transform, the Institute for Research in Technology at Comillas (IIT), RES4Africa, the Enel Foundation (EF), and the Florence School of Regulation (FSR). It happened as a side event to the Spain International Renewable Energy Conference (SPIREC) in Madrid from 21-23 February 2023. The event gathered about 40 experienced participants – from power pools, system operators, ministries, regulatory agencies, pan-African organisations, development financial institutions, think tanks, private companies, and academia – who debated under the Chatham House rule.

2.1. The program

The conference was structured around a 3-day schedule.

The first day of the conference started with a review of the current situation of power pools and the deployment of renewables in Africa, followed by a second session on the regional institutions supporting the power pools.

- The first session reviewed and evaluated i) the present situation of power pools in Africa – the level of development of governance, the volume of trade, the efficient utilisation of resources and security of supply issues – and ii) the status and potential of renewable generation in the continent – actual deployment, and existence of regulation and transmission infrastructure to facilitate their integration in the regional power system.
- The second session examined in detail one of the key topics that were addressed in the conference: The first one examined the suitability of the regional institutions – regional economic governance, regional regulatory authority and regional regulator –, the political commitment and the executive powers of each one of the regional institutions, comparing the actual and the desirable role of regional regulators and regional system operators, as well as the ultimate decision-making capacity in regional power trade.

Each of the sessions was preceded by a brief slide presentation summing up the reading material that the ASR team and collaborators had prepared for the event. These documents and the corresponding slides for each session of the policy dialogue can be found in the ASR website in the section devoted to this event:

https://africanschoolregulation.org/event/conference-power-pools-in-africa-releasing-the-potential-of-regional-power-trade/. Position papers #1 and #2 provided the necessary background for the first day.

On the second day, the meeting offered participants the opportunity to discuss regulatory measures to facilitate power trade in Africa. Proposals were made, based on the assessment of the situation of the African power pools that was made in the first day. The debate was organized in two sessions.

- The first session analysed two topics that must be properly addressed when trying to deploy network infrastructure with a regional perspective. On the one hand transmission planning, including the allocation of responsibilities in setting the criteria, decision making, enforcement and implementation. On the other hand, the usually conflictive issue of allocation of transmission costs in a multi-country context.
- The second session focused on key regulatory topics associated to the efficient operation of generation plants from a regional perspective, the management of trade transactions, issues with physical bilateral contracts, economic efficiency and security of supply.

Again, the debate in each session was preceded by a brief introduction that summarised the position paper that the ASR team had made available prior to the conference. All these documents can be found in the ASAR link provided above.

Finally, on the third day, a final wrap-up session reviewed the findings, discussed how to disseminate and implement them, and explored how the ASR could contribute to this task.

3. Highlights, findings and actionable decisions.

The sections that follow highlight the key topics in the position papers that were prepared for each session,[2] as well as the findings and common positions concerning the fundamental questions that emerged during the presentations and debates of the Policy Dialogue.

It can be stated without ambiguity that all participants discussed under the assumption that a strong regional – and even continental – integration of the national power sectors, defined by an efficient development and utilisation of the available generation resources, and the development of the necessary enabling transmission infrastructure and power plans of regional dimension, with a fair allocation of benefits and costs to all parties, are desirable objectives to be pursued in Africa.

One step further, which was emphasised in all the position papers and presentations delivered by the ASR team and collaborators is to accept the "single system paradigm" as the guiding principle in the design of regional power pools. This principle simply states that a regional power pool must function as close as possible in its operation and planning decisions, transmission regulation and governance to a single country of the corresponding regional dimension. In practice, loss-of-sovereignty concerns and implementation issues limit the application of this principle to some extent, depending on the topic and the circumstances in the power pool.

3.1. Regional institutions: Accomplishments, shortcomings, and paths for improvement.

The institutional arrangements of regional markets are meant to ensure an equitable distribution of participants' obligations and benefits, shared use of the transmission grid and power plants, coordinated operation, and some level of joint effort in infrastructure capacity expansion. This often entails trade-offs between the efficient utilisation of resources and national self-sufficiency.

The efficient utilisation of the energy resources of a multinational region to produce electricity to meet the regional demand requires a well-structured chain of decision making processes under an adequate governance approach with suitable institutions, see Figure 2.

At the bottom of the figure, the operation of the cross-border power exchanges, and the equilibrium between the production resources and the demand must be coordinated by the regional system operator to ensure security of supply and reliability in the utilisation of the available resources to meet the existing demand from a regional perspective.

Next, the existence of a regional planning entity that can identify cost-reflective production resources of regional dimension at least indicatively and propose regional transmission plans, which later must be agreed, approved, enforced and implemented. Typically, the system operator is the most technically qualified organisation to prepare the transmission capacity expansion plan.

Effective regulation of operation and planning calls for a key regional regulatory authority with strong executive power in regional matters.

Ideally, at the top of this chain of command, it is needed a political institution with the authority to mandate that the regulatory decisions adopted by the two regional institutions are duly enforced and implemented in each country of the region. For the African power pools these are the regional

[2] Only 13 countries in sub-Saharan Africa have power systems larger than 1 GW, while 27 have grid-connected systems smaller than 500 MW, and 14 have systems smaller than 100 MW.

economic communities (RECs). Position paper #2 describes the diversity of governance approaches in three African power pools: SAPP, WAPP and EAPP, their achievements and the shortcomings that limit them from reaching their full potential.

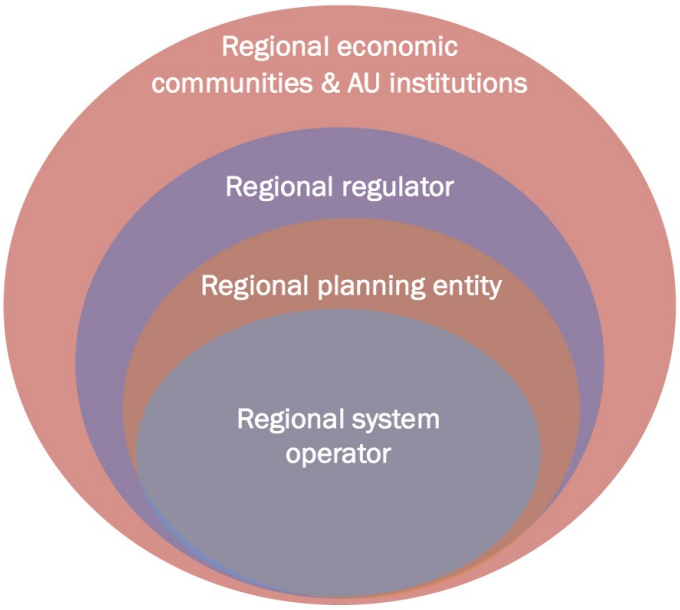


Figure 2. Hierarchical chain of governance and decision making process in power pools.

This potential remains largely untapped due to technical and political barriers. Effective power pools require a strong alignment of interest among participating countries and external partners, including private entities and financing institutions that are willing to invest in regional infrastructures under the right conditions. National-level political commitment is needed to give executive responsibilities and resources to regional institutions, identify barriers and vested interests that impede progress, and build the capacity to regulate and operate regional systems.

The main obstacles to achieving the benefits of power pools are well known: ineffective regional governance and flaws in the rules for regional trading and network cost allocation. Both discourage investments in transmission infrastructure and regional-scale generation plants, especially when combined with a lack of trust among states, a lack of willingness to liberalize markets, concerns over the preservation of national autonomy and sovereignty and a preference for bilateral contracts over regional agreements. The participants indicated that good results could be obtained under different organisation structures.

In the debate it was mentioned that during the first phase of the implementation of the EU Internal Electricity Market little progress was taking place, until the national regulators, system operators and some staff of energy ministries met – there was a series of meetings known as the Florence Regulatory Forum – and agreed on a package of actionable regulatory measures that were implemented immediately, and later formally approved and published as regional regulation.

Position paper #2 makes specific recommendations to accelerate the development of these power pools, to enable them by means of actions of their respective RECs, to cooperate with international organisations to bring and adapt the best international practices and to elicit the support of member states through national legislation and regulations. Participants pointed out that the lack of creditworthy off-takers is a major problem in SSA power pools, since this deters the much

needed investment in generation plants and the transmission network. They also highlighted the need to expand the membership in power pools beyond just utilities, with equal rights – for instance in taking decisions on modifications of market rules – for the new members as a means of extending the benefits of power trade more broadly, increasing liquidity and providing opportunities for financial risk reduction. More financial instruments to provide guaranties in cross-border transactions are also necessary. Participants also highlighted the challenge of attracting and retaining qualified staff in their organisations.

3.2. Market rules for efficient operation.

A preliminary consideration: "markets" are just one possible form of trading power.

Power trade at regional level can exist under organised market conditions or by bilateral agreements between parties without the need for an organised market or under a centralised organisation making all decisions about which power plants can meet the demand of a region at a given time. Power pools existed in the 1970s in several regions in the USA or in Spain (1985), for instance, allowing power to be traded among several vertically integrated utilities without the existence of wholesale markets, which only began to appear in Chile (1982) and later in the UK (1990). The common feature of those power pools was the least cost centralized dispatch of electricity production resources, i.e., that the most efficient available generation units were employed to meet the aggregated power pool demand at all times (subject to transmission constraints). The participants in some power pools also developed joint capacity expansion plans of transmission and sometimes also of generation.

Most cross-border regulatory arrangements currently employed throughout the African continent generally happen by bilateral agreements between parties, without competitive markets at national level. Some regions like Southern Africa and more recently West Africa have implemented organised regional markets at different levels of development. Given this diversity of situations, we should avoid using the term "market" when referring to common general situations in Africa and will use the term "power system organisational structures" instead, as recommended by IRENA recently.[3] All regional power system structures existing in Africa at bulk power system level, liberalised and regulated, face common challenges when trying to trade power efficiently.

Compatibility of operation and trading rules with the "single system paradigm".

As indicated before, for the sake of achieving maximum efficiency in the utilisation of the production resources in a region, the criteria underlying the regulation and business models of both operation and capacity expansion must follow as closely as possible the "single system paradigm".

When existing power pool operation rules fall short of this ideal, the efficiency and security of supply deteriorate. For instance, in SSA power pools, the stakeholders like physical bilateral contracts that are dispatched with priority to any other power plants because they provide confidence that the power plant will be operated, the demand will be served and transmission will be utilised. However, current physical bilateral contracts distort the economic dispatch of generation and demand. The 2020-2023 WAPP Master Plan says: "Indeed, up to now, contracts for the exchange of electricity between States are subject to bilateral agreements with a fixed rate for a long period and are

[3] They are available at website of the African School of Regulation https://africanschoolregulation.org.

monitored by a meter on the interconnection line. These contracts that proved their value in a radial market could be ineffective or sub-optimal in a large interconnected and meshed network in which all generation options should be able to compete."

Dispatching the physical bilateral contracts (PBC) with full priority when there are no scarcity of generation in a region frequently results in inefficient utilisation of the available generation power plants. Participants discussed how the legitimate concerns that have been the basis for the predominant utilisation of PBCs could be safeguarded through alternative approaches that respect the economic merit order in the dispatch of the power plants at regional level, subject to restrictions that may be freely imposed by the member states within their territories, and can benefit all the involved parties.

It was recognised that regional economic dispatch of generation purely based on variable costs may encounter opposition, since it requires to declare the variable costs of each plant to the system operator. It was pointed out that alternatives exist, like the one adopted in the Central American Regional Market, where national daily dispatches happen first – run by the national system operators – and the regional dispatch is based only on the selling and buying bids presented at prescribed network nodes by the national system operators to the regional system operator so that a regional economic dispatch can be made.

Some participants acknowledged that poor regulation or its absence – can be an obstacle to efficient power trade. For instance, in addition to what has been mentioned above, high wheeling charges between two parties exploring a bilateral transaction that they consider attractive can render it uneconomical, so that it will never happen (more on this in the next section 3.3). Contract standardisation was mentioned as an approach to increase regional power trade. Storage will become important because of the expected high penetration of renewables, thus requiring a suitable regulatory framework for this new key technology.

Regional power trade, security of supply and the single system paradigm.

Security of supply is a critical concern in all power systems. The vast majority of national systems that also belong now in regional markets were originally designed to be self-sufficient, and there was a strong belief among people working in the power sector that security of supply is a national issue. However, greater levels of coordination and communication are now needed to manage increasing levels of cross-border electricity flows, many times associated with regional generation projects of a regional scale, and there is a growing awareness that security of supply can no longer be viewed as a national issue for interconnected systems, as implied by the "single system paradigm".

In all kinds of power system organisational structures, concerns about security of supply have led governments and market participants to engage in firm long-term physical bilateral contracts in the initial stages of international power trade. These contracts have long been viewed as necessary in order to obtain financing for investments in "regional" generation plants, i.e., plants that only make economic and physical sense when a substantial part of their production is meant to be exported to other countries.

It was discussed in the previous section how to avoid that firm physical bilateral contracts may interfere with the efficient dispatch of generation at regional level (see Position Paper #5 for further details) while keeping their capability to secure supply. However, the real difficulty with cross-

border firm bilateral contracts is the lack of confidence that they will be honoured in the event of a shortage of supply in the exporting country. All power pools involving multiple countries have struggled with this problem, which seriously holds back the deployment of regional power plants.

3.3. A regional approach to transmission investment and cost allocation.

Deployment of network infrastructure with a regional perspective.

Participants unanimously pointed out that transmission infrastructure is the major bottleneck for regional power trade. Thus, facilitating regional power trade requires investments in regional interconnections supported by capable institutions and sound regulation.

The "single system paradigm" must guide the design of transmission capacity expansion planning in a power pool. Regional transmission planning requires a technically capable regional system operator and the means of enforcing that what has been planned at regional level will be finally built by the countries, which in territorial issues always have the last word. A workable system of checks and balances is necessary so that the transmission investments that have been identified as socially beneficial from a regional perspective will be accepted by the individual counties in whose territories the lines must be built.

A key aspect in this multi-party negotiation is to make sure that every country perceives that the benefit accrued to the country by a transmission investment is larger than the fraction of the cost of the investment that the country will have to pay. This brings to the fore the always conflictive issue of transmission cost allocation in a regional context that was discussed in a different session. The participants commented on their respective regional master plans, generally lacking effective enforcement mechanisms. It was discussed how the EU Internal Electricity Market has implemented a workable regulatory package including mid- and long-term regional transmission planning at specified intervals by the regional system operator ENTSO-E, an agreed approach to cost allocation of regional transmission infrastructure, the existing arrangements between the European Commission, the regional regulator ACER and the member states to enforce the implementation of the regional plans, and a system of incentives to accelerate the deployment of the projects of highest regional priority.

Removing risks from transmission remuneration

Participants in the policy dialogue agreed that building more transmission lines and upgrading transmission capacity will be an essential part of the overall expansion of the African electricity sector and it is indispensable for power trade to happen, especially cross-border trade. This can only be done by attracting massive private investment. Presently almost all transmission investment in Africa is financed by state-owned enterprises.

Transmission meets the well-established requirements of a natural monopoly, except under some unusual conditions.[4] Therefore, the remuneration and the performance of this activity must be

[4] The term "power system organisational structures" can be used to refer to the systems, institutions, procedures and social relations through which electricity services are exchanged and rewarded. It encompasses all systems, from liberalised power systems (based primarily on market mechanisms) to vertically integrated systems. For a liberalised power system, the term "power market" is equivalent to "power system organisational structure". See IRENA (2022), "Re-organising power systems for the transition", International Renewable Energy Agency, Abu Dhabi.

strongly regulated and it is important that the regulation be right: the institutions, criteria, procedure and enforcement of regional transmission planning; the determination of transmission cost and the allocation of this cost to the agents of a regional organisation structure; and the rules to share the use of the existing limited transmission capacity in the real time operation of the power system.

Sound transmission regulation is a prerequisite to attract private investment. In particular, this regulation must be carefully designed to avoid introducing risk – which increases the cost of capital – in the remuneration of transmission unnecessarily. The remuneration of a transmission project must be established by the regulator as the result of a tender or based on some procedure to determine the efficient cost – investment, operation and maintenance – of providing this service. Once determined, this cost of each transmission project will be recovered via regulated charges to the users or beneficiaries – consumers and producers – over the lifetime of the asset, and beyond to recover any life-extension costs. The key idea is to remunerate transmission by determining the cost to be recovered first and then determining the regulated charges that will permit to recover these costs, and not the inverse, i.e., invent some procedure to compute transmission charges and then hope that these charges will pay for the costs of transmission.

The following flawed regulatory measures that are frequently adopted create unnecessary risk *(therefore perfectly avoidable)* in the remuneration of the transmission activity, therefore discouraging private investment:

- Revenues that depend on transactions or volume of utilization, instead of the actually incurred costs, or standards, or results of an auction.
- Regulatory updates of the historical rate base, based on "replacement costs", "market value", or other creative methods.
- Failure in ring fencing the transmission revenue requirement in the revenues obtained from the end customer tariffs.
- Flawed cost allocation methods that lead to opposition to pay charges that are considered unfair.
- Frequent re-calculation of transmission charges or changes in methodology.
- Performance-based incentives that go beyond the equipment failure.
- Uncertainty in remuneration beyond the economic life of the transmission asset.

Cost allocation of regional transmission projects

The absence of sound, commonly-agreed procedures to allocate transmission costs will deter potential investors as it increases the risk of not receiving sufficient economic compensation. Inadequate charges for cross-border transactions that use regional interconnections will stifle trade until sound transmission pricing rules are implemented. A summary of best international practices in transmission cost allocation was presented by the ASR team in the Policy Dialogue, as described in the Position Paper #3. The key messages in the presentation of this paper were:

i) The first key step must be the determination of the regulated revenue requirement for each transmission project or asset (via a tender or using some regulated standard cost) to be recovered via regulated charges to consumers and power plants, by some cost allocation method that guarantees that the annuities over the lifetime of the asset will be covered by

the regulated transmission charges to be established. Transmission investors will have to finance their projects by making compatible the guaranteed payment of transmission charges over a long period of time with the conditions set by the financial institutions lending the money for the project.

ii) Transmission charges should not be in any form connected to commercial transactions, i.e., avoid trying to recover the costs of cross-border transmission assets only from those agents engaged in commercial transactions, since these transactions should be ignored when determining transmission network charges. This rule, accepted long time ago in the most advanced power pools, has been ignored for the most part in African regional organisations, resulting in excessive (and wrong) transmission charges that discourage most of the agents that want to trade.

The participants debated about the difficulty of adopting and adapting these best international practices in African power pools, given the present strong reliance in physical bilateral contracts, and the apparent guarantee of income for the transmission projects if those "using the lines" must pay for wheeling power through them to trade. It was acknowledged that a radical mindset change concerning how transmission charges are currently designed in Africa would be needed, and that a transition process would have to be carefully discussed and implemented. On the other hand, the imminent inauguration of important transmission projects and the decisions to proceed with others require decisive action in this regard to avoid entrenched positions in the future of those that would lose when better regulations will be finally adopted.[5]

Another delicate aspect of transmission regulation that was debated among the participants is the format to be used when actually applying the transmission charges to consumers and producers, i.e., whether the charges take the form of i) a lump sum ($/year) once per year or ii) a volumetric component ($/kWh) per kWh produced to generators or included in the regulated tariff of consumers, or iii) proportional to the nominal capacity of the generation plants ($/kW) or to the contracted capacity of a consumer. This is important, since it will have an impact on the behaviour of the agents. For instance, a volumetric charge ($/kWh) must be considered by a generation plant as an additional variable production cost, therefore with impact in its merit order in an optimal economic dispatch, and a charge ($/kW) proportional to the plant's nameplate capacity is biased against peaking generators with respect to baseloaded plants. It is advisable that transmission charges to generators be applied as an annual sum whose value cannot be directly related to actual production volume.

Other topics that were discussed include i) the challenges found when trying to make power plants to participate in the provision of ancillary services in organised markets, which will be increasingly needed to facilitate a high penetration of renewables; ii) the difficulties in enforcing the utilities' compliance with grid codes that have been agreed by the national system operators, because of the weak executive power of national regulators; iii) the frequent operational situations that turn "firm bilateral contracts" into "best efforts contracts".

[5] The so-called merchant lines – unregulated lines whose income results from purchasing power at one end and selling power at the other end – can make economic sense under very special circumstances and almost never in a well-developed power system. See I. Pérez-Arriaga (editor) (2013). "Regulation of the Power Sector". Springer Verlag. https://link.springer.com/book/10.1007/978-1-4471-5034-3

4. The potential contribution of the ASR to capacity building in power trade and other relevant regulatory topics for the African energy sector

During the last session the participants mostly debated on the need for capacity building in all matters related to regional power trade and the role that the African School of Regulation could play in this activity.

While taking stock of the current issues facing regional power trade in Africa, some of the power pools highlighted the importance of regional regulators with a clear mandate on power pool members, regional regulation and minimum standards for policy harmonisation. They also pointed to the need for capacity building of national regulators on regional issues, as they are often the ultimate enforcers of the rules.

Participants expressed strong views on the need for capacity building on issues related to regional electricity trade, as well as on many other important energy regulatory topics. This capacity building should not be "academic" but close to the actual challenges in energy regulation that must be addressed by regional and national regulatory authorities and other organisations. In other words, they wanted the ASR to be a teaching institution searching the solutions to the multiple practical problems in energy regulation in the continent.

Political economy aspects must be carefully considered in ASR training, and an objective of the ASR must be reaching out to politicians with clear policy and regulation messages. The ASR must be established so that it remains – now and in the long term – independent from political influence, but ready to contribute to building a better energy policy. However, the focus of the ASR must be regulation, which must be hierarchically subject to public energy policy.

Specifically, regarding regional power trade, participants distrusted copying and pasting solutions in Africa that might have worked in other contexts – typically in advanced countries – but that need a profound revision before trying them in African power pools. The importance of collecting data on the performance of the power sector was emphasised as the basis to take sound regulatory decisions. It was suggested to make use of expert professionals working in the power sector as instructors and to "embed" ASR staff or alumni in utilities, regulatory agencies or ministries to reinforce the link ASR / power sector.

Many other recommendations were made regarding the design of the future ASR, such as being always inspired by the Agenda 2063 and the international commitments regarding the clean energy transition, the Sustainable Development Goals and the fight against climate change; to make sure that the ASR always incorporates the diversity of the African continent in the composition of its staff and in the topics that are addressed; to continue making use of the policy dialogues to capture the actual debates on energy regulation in Africa; and to include clean cooking and the broad strategy of utilisation of fossil fuels in Africa – from LPG for cooking to natural-gas-fired generation plants to accelerate the industrialisation of the continent.

5. Summary

The conference provided a unique platform for a structured high-level discussion on the accomplishments and pending challenges of the regional structures for the promotion of power trade that have emerged in Africa during the last two decades.

Participants in the conference unanimously acknowledged the substantial benefits that can be derived from a vigorous trade of power among countries – including enabling renewable generation among other advantages – particularly in sub-Saharan Africa (SSA), and the relevant role that the power pools that cover the entire continent can play in this regard.

The limitations in each one of the several layers of decision-making that govern regional power trade are well-known and were also recognised. Effective governance at the maximum regional level must provide political backing, economic and policy guidance and ultimate support to enforcing the decisions made by the two key regional institutions, i.e., the regional system operator and the regional regulatory authority. In the end, the activities of the agents in the power sector must be correctly regulated and operated following the dispositions made by these two regional entities.

However, the RECs often lack the power to enforce plans or other decisions made by the regional operator and the regional regulator and have not bestowed enough executive power to these two key regional institutions, which sometimes do not make use of the power that they actually have to enact regional regulations and operate the regional power systems effectively. Of equal or even larger importance is the fact that some key international best practices in cross-border power contracting, transmission remuneration and allocation of cross-border transmission infrastructure among the countries in an interconnected region, have not been adopted or even seriously considered in African power pools.

Participants in the Policy Dialogue made explicit the reasons that explain the divergence between well-accepted international practice – correct, although sometimes counterintuitive, because sound regulation requires some level of mastery of this complicated subject that blends engineering, economics, law and social sciences – and the diverse actual implementations in African power pools. These reasons must be well understood and properly addressed, before regulatory changes are made. The participants were interested in exploring paths to adapt and adopt proven best practice. This requires a clear vision of the intended result and a decided but prudent implementation pace. The African School of Regulation was invited to get involved in this process, providing education that responds to the actual needs and applied research that reveals the best "African way" to meet the practical regulatory challenges of regional power trade.

Annexes

The following position papers were prepared by the ASR team and collaborators for each one of the sessions of the Policy Dialogue and can be downloaded from the ASR website at the following link: https://africanschoolregulation.org/event/conference-power-pools-in-africa-releasing-the-potential-of-regional-power-trade/.

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