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Regulatory
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Regulators in Southern Africa Make Progress Towards Promoting Cross-Border Electricity Trade



October 2021 – While Southern Africa has an abundance of energy resources, only 43% out of a population of 177 million in the region have access to electricity.ⁱ Furthermore, electricity demand is expected to grow in the region by 3.4% per year by 2040.ⁱⁱ To address these challenges and achieve sustainable socio-economic growth, energy regulators in Southern Africa are working to increase electricity reliability and access by further

harmonizing their power sectors and improving conditions for cross-border electricity trade.

With funding from the U.S. Department of State’s Bureau of Energy Resources (ENR), Power Sector Program, the National Association of Regulatory Utility Commissioners’ (NARUC) work in Southern Africa is part of a larger U.S. Government-funded initiative to improve the energy market and investment climate by supporting regional integration, economic growth, and poverty eradication. To this end, NARUC engages in a regulatory partnership with the Regional Electricity Regulators Association (RERA) of Southern Africa and three of its member regulators chosen to lead the effort. They include the Botswana Energy Regulatory Authority (BERA), Namibia’s Electricity Control Board (ECB), and Zambia’s Energy Regulation Board (ERB).

Botswana, Namibia, and Zambia are also members of the Southern African Development Community (SADC), an inter-governmental organization that aims to promote economic cooperation through regional integration.ⁱⁱⁱ NARUC anticipates that the lessons learned and tools developed throughout the partnership will serve as a model for other SADC countries as it works to create an enabling environment for investment, promote access to affordable and reliable energy, enhance energy security, and pursue the development of a harmonized and regionally integrated electricity trading market.

Benefits and Challenges of Developing a Regionally Integrated Electricity Market

The SADC established RERA in July 2002 to facilitate regulatory policy harmonization, legislation, standards, and practices and serve as a platform for effective cooperation among energy regulators within the SADC region.^{iv} In addition to carrying out these objectives, RERA plays a vital role in establishing regulatory guidelines that enable the development of a regional electricity market in Southern Africa.

There are many benefits to regionally integrated markets. Notably, they allow for cross-border electricity trading, which can improve reliability, affordability, and access to electricity by enabling countries with surplus energy to exchange power with countries experiencing energy deficits. By connecting respective national grids to a regional grid, countries can eliminate the cost of investing in local generation capacity and bolster energy security by increasing the diversity of available energy resources.^v Moreover, as many countries in Southern Africa have enormous untapped potential for renewable energy development, cross-border electricity trade can provide the flexibility needed to

accommodate higher shares of renewables in the energy sector. By sharing production capacity for renewable energy resources across borders, countries in the region can strengthen the reliability of their power supplies and meet national climate commitments by reducing carbon dioxide emissions associated with power generation.^{vi}

Southern Africa faces several challenges to developing a regionally integrated market. Because there is currently no regional regulatory framework, national level initiatives are not always aligned with those at the regional level.^{vii} Additionally, many countries in the region require significant private investment in upgrading power transmission and distribution infrastructure to mobilize cross-border trade. Consequently, regional organizations must work to address technical gaps and harmonize regulatory tools in order to boost investor confidence and optimize the efficiency of grid upgrades and integration.

To assist on this matter, NARUC experts brought RERA and regulatory representatives from the ECB/Namibia, the ERB/Zambia, and BERA/Botswana together to peer review Namibia and Zambia's national grid codes, discuss common regulatory challenges, and provide targeted feedback and suggestions for improvements. Grid codes specify technical requirements needed to ensure safe operation and performance of the power system for all users of an electricity network and can vary among different countries. By harmonizing grid codes on a regional level, regulators are better able to ensure technically feasible, reliable, and economical power exchange, thereby protecting the interests of both investors and consumers.



For these reasons, NARUC experts advised that RERA member grid code reliability standards should be clearly outlined and consistent with one another to ensure the regional power system operates reliably and can support efforts to strengthen and expand grid interconnections. The experts also recommended each commission revise its transmission and distribution licensing frameworks within its respective grid codes to facilitate an efficient exchange of power between countries. In response, RERA stated that it would like to see national grid codes take international trading standards into account to assist in a smooth transition to a regional market, to which the participating regulatory representatives agreed.

Incorporating Renewable Energy into the Generation Mix

Projections indicate that electricity demand in the SADC region is expected to reach 920TWh by 2050.^{viii} As a result, there is an increased emphasis on providing reliable, low-cost power by replacing more commonly used coal-based generation and nuclear power in Southern Africa with additional

hydropower and other renewable energy technologies.^{ix} Regionally integrated markets can help to facilitate this process by balancing renewable energy production patterns across larger territories to increase their share of the generation mix.

A successful shift towards the use of renewable energy resources to achieve electricity sustainability requires energy regulators in the region to coordinate long-term energy planning efforts to promote regulatory transparency and predictability. This includes ensuring that regulators are actively sharing knowledge and experiences that can benefit decision-making and promote regional cooperation.

To help facilitate this process, RERA, the ERB/Zambia, the ECB/Namibia, and BERA/Botswana consulted with NARUC experts to identify international regulatory best practices for integrating renewable energy technologies – both on a national and regional level – and to learn practical solutions to address intermittency concerns. Through this opportunity, the regulators shared and discussed their priorities and challenges regarding renewable energy goals. Additionally, they learned about ways to strengthen their regulatory frameworks that will help to encourage private sector investment.

These same regulatory commissions have also benefitted from NARUC’s sharing of best practices on electricity generation and transmission planning. For power systems to operate reliably, regulators must project short-and long-term electricity demand and plan the generation mix so power systems are able to meet consumer needs at all times. However, determining the amount of renewables that can be integrated into an existing grid system without compromising current energy reserves and distribution systems can be a challenge. To accommodate this issue, participating regulators used NARUC engagements to learn from and interact with one another, share their country’s visions for both short- and long-term generation mixes, and gain a better picture of sustainable generation resources in the region.

Program Impact

Following a NARUC peer review on integrated resources planning, or long-term generation planning, ECB/Namibia participants expressed that “we now have confidence on where to go from here with the [IRP] roadmap.”

Moving forward, advancing regulatory tools and frameworks that promote the integration of national electricity systems will be key to fostering cross-border cooperation, promoting regional economic growth, and providing increased energy security and reliability. By coming together to discuss their respective power sector challenges and exchange ideas on how to address them, regulators in Southern Africa are paving the way for the creation of a reliable regional electricity market and a more connected, sustainable future.

ⁱ Hadebe, Dudu, Hansa, Ahmed, Ndlhovu, Caswell, and Kibido, Mbulelo. “Scaling Up Renewables Through Regional Planning and Coordination of Power Systems in Africa—Regional Power System Planning to Harness Renewable Resources and Diversify Generation Portfolios in Southern Africa.” SpringerLink. <https://link.springer.com/article/10.1007/s40518-018-0119-3>

ⁱⁱ “Planning and Prospects for Renewable Power: Eastern and Southern Africa.” IRENA. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2021/Apr/IRENA_Planning_Prospects_Africa_2021.pdf

ⁱⁱⁱ “About SADC.” SADC. <https://www.sadc.int/about-sadc>

^{iv} “Importance of regulators in emerging electricity markets” EE Regulators. <https://www.ee.co.za/article/importance-regulators-emerging-electricity-markets.html>

^v Deonarain, Bhavna and Montmasson-Clair, Gaylor. “Regional Integration in Southern Africa: a Platform for Electricity Sustainability.” Trade and Industrial Policy Strategies. October 2017. PDF.

^{vi} “Planning and Prospects for Renewable Power: Eastern and Southern Africa.”

^{vii} “Opportunities to Support and Increase Regional Power Trading in Southern Africa.” Infrastructure and Cities for Economic Development (ICED). http://icedfacility.org/wp-content/uploads/2019/07/ICED_SouthernAfricaPowerTrading.pdf

^{viii} Mutangda, Shinirirai and Simelane, Thokozani. “Electricity Generation: A Driver of SADC Regional Integration?”

<https://emsdialogues.org/wp-content/uploads/2016/02/Electricity-Generation-A-Driver-of-SADC-Regional-Integration.pdf>

^{ix} “SOUTHERN AFRICAN POWER POOL: Planning and Prospects for Renewable Energy.” IRENA. <https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2013/SAPP.pdf>