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SOUTHERN AFRICAN POWER POOL (SAPP) ENERGY EXECUTIVES DISCUSS POWER MARKET EXPANSION

USEA EXECUTIVE EXCHANGE ON DEVELOPING AN ANCILLARY SERVICE MARKET



SAPP delegates meeting with PJM (left to right): Aderito de Sousa, EDM; Mziyanda Mbuseli, Eskom; Paulina Iyambo, NamPower; Jim Kirby, PJM; Chrissie Franks, PJM; Lion Mashiri, ZESA; Thema Molubi, BPC; Suleimane Combo, HCB; Doctor Simelane, SEC; Mike Mkayenda, Escom; Musara Beta, SAPP Coordination Centre; Eduardo Nhacule, Motraco; Christian Msyani, TANESCO; Armstrong Ntlaloe, LEC; and Alex Kadiayi,

Under the Energy Utility Partnership Program funded by the U.S. Agency for International Development (USAID), the U.S. Energy Association conducted an Executive Exchange on Developing an Ancillary Service Market from February 28 to March 2, 2013. The participants included the members of the Southern African Power Pool (SAPP) Markets Subcommittee. The exchange was conducted with meetings held at the **Federal Energy Regulatory Commission (FERC)**, **PJM Interconnection (PJM)**, **New York Independent System Operator (NYISO)**, the **North American Electric Reliability Corporation (NERC)**, **Georgia Power**, and **Alabama Power**.

The purpose of the executive exchange was to examine the standards and trends used in the U.S. in the area to develop balancing ancillary service markets as well as gaining a better understanding of the progression of U.S power pools to independent system operators. With their vision of developing a competitive electricity market in the Southern African region, this exchange will allow the participants to gain knowledge that will better prepare them for this transition.

SOUTHERN AFRICAN POWER POOL

The Southern African Power Pool (SAPP) membership is currently comprised of 16 utilities, independent transmission companies, and independent power producers representing the countries of Angola, Botswana, Democratic Republic of Congo, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia, and Zimbabwe

Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia, and Zimbabwe. The goal of SAPP is to optimize the use of energy resources in the region as well as supporting each other in emergencies.

Currently, the Southern African region does not have enough supply to meet the demand and faces regular power outages in many of the countries. It is estimated that on a daily basis there is a shortage of approximately 2,000 MWs. There are plans to build an additional 6,500 MWs of generation between now and 2016, however there needs to be some short-term solutions to addressing the shortfall in the region.



SAPP delegates meeting with members of the New York ISO.

The exchange of power within Southern Africa has traditionally been handled through long-term bilateral contracts. These contracts continue to be the preferred method of energy exchange even with the SAPP developing their energy market. In addition to utility to utility bilaterals, there is a SAPP short term energy market (STEM), post-STEM, and day-ahead market. There are plans to also add an ancillary service balancing market and financial markets all in the hopes of implementing a more competitive regional market. This competitive market may help to better utilize the energy resources in the region, however; there will be some challenges as this move is being implemented during a time of inadequate generation supply.



EXECUTIVE EXCHANGE HIGHLIGHTS

The executive exchange began with the delegation visiting Washington, DC. USEA hosted a public briefing in which the SAPP member country representatives presented an overview on the current energy situation in their respective country. It was an opportunity to highlight the advances being made, programs implemented, and future development plans. A member of the Southern African Power Pool (SAPP) Coordination Centre gave a regional perspective and the challenges facing them as they address the need for increasing their generation capacity. The briefing was well attended and

received with the audience showing interest in what is happening in the region.

FERC AND NERC MEETINGS

The delegation then met with FERC to discuss the regulation of interstate transmission service and the difference between state and federal regulation. Later meetings with Georgia Power and Alabama Power gave the participants a clearer picture of the regulatory responsibilities of the state commissions. The visit with NERC focused on their responsibility as an Electric Reliability Organization (ERO) and how they ensure the reliability of the bulk power system in the U.S. The discussion of instituting standards for reliability was of interest to the SAPP delegation. There currently are reliability standards in the region, however there are issues with enforcement and monitoring.

While visiting with Georgia Power, Dr. Deng of the Georgia Institute of Technology presented a paper on pricing and valuation of the U.S. energy market. With congestion management being an issue in the Southern African region, the delegation found the topic of congestion pricing interesting as it presented options for using nodal pricing and futures.

The exchange concluded with a visit to Southern Company's Energy Trading Floor located at Alabama Power. They are a market based operation offering both a day ahead and short-term market; similar to those being offered by SAPP. The delegates related best to this form of power exchange as it incorporated both bilateral contracts and a market.

CROSS BORDER ENERGY EXCHANGE

In the U.S. we have mostly moved from the traditional power pool to an independent system operator for our power exchange. Within the Southern African region, the traditional pool structure is still being utilized. The most significant difference between the two structures is that in the U.S. the majority of the utilities have given over the management of their transmission lines to the ISOs. This allows them the ability to better optimize the transmission in a way which benefits the region. With the power pool system, the individual utilities still have control over their own lines and can therefore dictate



Members of the SAPP delegation meeting with Georgia Power in Atlanta. Picture also includes Dr. Shi-Jie Deng, Georgia Tech (front row, first from left) and Carlton Blue, Georgia Power (back row, fourth from the left).

how they can be utilized. Within SAPP, there is some resistant to giving over the control of their transmission lines to an independent operator as the utilities feel they will not have the ability to handle any emergencies within their own country. It was stressed at both PJM and the NYISO that there needs to be transparency in order to ensure reliability, conduct regional planning, and operate the energy market.

SOUTHERN COMPANY AND ENERGY MARKETS

The SAPP delegation felt their visit with Southern Company best fit the model being used within their region. The utilities are still mostly vertically integrated and they operate within a bilateral market; although the time of their bilaterals are only up to two years. The bilaterals in the SAPP region tend to be in place for a longer period of time. Any surplus after the obligations of the bilaterals have been met are then made available on the day-ahead and hourly markets

Some of the key indicators of a healthy market, as stated by Southern Company, fit closely with the goals of the SAPP. They included:

- Satisfied customers
- Competitive prices
- Reliable operating performance
- Adequate resources
- Generation performance and investment
- Reserve margins
- Fuel diversity
- Transmission investment
- Transparency
- Innovations in technologies and products

The indicators listed above can be used as a roadmap to optimizing the energy resources and markets in the region.

NERC STANDARDS

The North American Reliability Corporation (NERC) is responsible for ensuring that the bulk power system in the U.S. is able to meet the demands of the end-users even when unscheduled disturbances occur. This reliability can only be achieved by maintaining and enforcing regional standards that have been developed through the involvement of the key stakeholders.

The idea of an ERO within the Southern African region would be instrumental in developing and enforcing reliability standards to ensure that the system is able to meet any unforeseen demand. Unfortunately, this may not be achievable until additional generation has come on line to meet the energy demand.

RESULTS

The Executive Exchange provided an opportunity for the delegates to gain further insight into the role of ISOs in the U.S. and the coordination between FERC, ISO's, NERC, and utilities. The expansion of the energy market within the SAPP region will need to incorporate regulation that allows utilities to cover their costs and adequate and reliable supply of electricity.

The SAPP delegates plan to work on the following issues as they develop the SAPP power market:

- Increased openness and transparency within the market
- Development of relevant trading tools
- Alternative solutions for congestion management in the region
- Improving the regional operational guidelines
- Improving the scheduling of bilateral contract power delivery
- Better real time pricing
- The use of transmission rights, both financial and physical

The energy companies within the Southern African region realize they have challenges they will need to meet as they consider adding an ancillary service market. With their vision of moving towards a more competitive energy market, there needs to be discussion among utilities on regulation and pricing to make the situation advantageous enough to encourage

foreign investment. As ancillary services are typically resources such as reserves, the SAPP has a tough challenge ahead to include an ancillary service market with very low regional reserves.

SAPP EXCHANGE PARTICIPANTS

BOTSWANA

- Mr. Thema Molubi, Engineer – Electricity Trading, Botswana Power Corporation (BPC)

DEMOCRATIC REPUBLIC OF CONGO

- Mr. Alex Kadiayi, Director of Transmission, Societe Nationale d'Electricite (SNEL)

LESOTHO

- Mr. Armstrong Ntlaloe, Control Engineer/Senior Energy Trader, Lesotho Electricity Company (LEC)

MALAWI

- Mr. Mike Mkayenda, Control Engineer, Electricity Supply Corporation of Malawi (ESCOM)

MOZAMBIQUE

- Mr. Aderito de Sousa, Director, Market Operations, Electrcidade do Moxambique (EDM)
- Mr. Suleimane Combo, Power Trader, Hidroelectrica de Cahora Bassa (HCB)
- Mr. Eduardo Nhacule, Technical Manager, Mozambique Transmission Company (MOTRACO)

NAMIBIA

- Mrs. Paulina Iyambo, Senior Energy Trader, Namibia Power Corporation (Nampower)

SOUTH AFRICA

- Mr. Mziyanda Mbuseli, Trading Operation Manager, Eskom

SWAZILAND

- Mr. Doctor Simelane, System Control Engineer, Swaziland Electricity Company (SEC)

TANZANIA

- Mr. Christian Msyani, Senior Manager, Transmission, Tanzania Electric Supply Company Limited (TANESCO)

ZIMBABWE

- Mr. Lion Mashiri, Electricity Trading Manager, Zimbabwe Electricity Transmission and Distribution Company (ZESA)

SAPP

- Mr. Musara Beta, Chief Market Analyst, Southern African Power Pool Coordination Centre

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