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NEC battery system bridges power shortages for water supply in South Africa

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NEC XON, a subsidiary of Japanese information technology company NEC, is gearing up its battery system business in South Africa and neighboring countries where power shortages are still a major obstacle to the continent's sustainable economic development.



Students drink water at a well at the Alpha Secondary School on February 7, 2013 in Bayswater, a village near Limpopo, South Africa. ©MUJAHID SAFODIEN / AFP

South Africa is the only member of the G20 on the African continent and is a founding member of BRICS together with China, Russia, India and Brazil. Rich in mineral resources, it has one of the 3 highest GDPs in Africa.

On the other hand, its domestic economy is under stress due to inflation and high unemployment. In particular, the country's power shortage has a negative impact on business activities. Government-owned power plants suffer from ageing equipment, resulting in frequent unplanned blackouts. Scheduled load shedding has also affected water supply facilities, with a significant impact on people's life.

In 2023, NEC XON ^{*1}, based in sub-Saharan Africa, undertook a project to install an emergency battery energy storage system (BESS) at the Clapham Pumping Station in Limpopo Province, operated by the Lebalelo Water User Association (LWUA), a public-private joint water utility established in 2002.

LWUA has been operating the water supply infrastructure in this area for more than two decades. Its planned 100-kilometer pipeline will supply water throughout the Sekhukhune District Municipality and Mogalakwena Municipality, some 300 kilometers northeast of Johannesburg.

The main industry in the region is mining, and water from the Clapham pumping station plays an important role in mining operations. Once completed, it will also supply domestic water to some 380,000 people in more than 100 municipalities. Water from the pumping station is essential to the day-to-day life of communities and industry in the region.

The Clapham BESS started operations in July 2023. The 3.4MWh containerized BESS solution from partner Solar MD includes 1MW AEG inverters and 630kVA transformers along with variable frequency drives for the 500kVA pumps.

Now the pump station is self-sufficient in electricity for up to four hours a day. This is key to operations as load shedding is still on-going in South Africa as of January 2024.

Prolonged power shortage

South Africa's power outages can last for several hours each day and there is little prospect of an improvement in the short term.

Many of the country's coal-fired thermal power stations were built during the apartheid era and require frequent maintenance. In addition, the financial difficulties of the national power company, Eskom, is affecting operations at power stations.

Eskom has warned that South Africa's power crisis could continue for another five years or more. Even in the best-case scenario, the country will not have enough power to meet its electricity demand, Eskom noted, stressing that the situation may worsen if the decline

in power plant reliability cannot be halted, and new capacity cannot be introduced quickly.*²

By eliminating real-time power shortages with the BESS, this initiative mitigates the disruption of water pumping operations, ensuring a stable supply of water to local communities and commercial users.

Huge Responsibility

“We have a huge responsibility as an NEC company to ensure the success of this project,” said Herman Viljoen, General Manager of Renewable Energy and Energy Storage at NEC XON.

“Social infrastructure directly influences lives in South Africa, with water being a key resource,” Viljoen said in an online interview.

In addition to the mining sites, water in future will be delivered to various other places such as agricultural land as well as educational and recreational facilities, he said, adding: “So this project is really a

lifeline for the communities by providing water security.”

LWUA Chairperson Prakashim Moodliar said the water delivery program will lead to economic growth in the region, expressing hope that “this model will be a catalyst for many similar infrastructure programs.”

South African Minister of Water and Sanitation Senzo Mchunu also recognized the project as a major milestone in the country's development, saying: “This partnership represents a new era in water service delivery. It represents a leap in the qualitative transformation in South Africa and we are proud of it.”

In addition to the BESS program, NEC XON has also participated in a school infrastructure project. At Kwata Primary School in Limpopo, NEC XON and other companies are helping set up facilities for water supply and Internet access at the school. NEC XON built an integrated solar power and energy storage solution to support the energy needs of the school.

Infrastructure demand spreading across Africa

Amid concerns about power shortages also in South Africa's neighboring countries, NEC XON aims to expand its energy storage business to other African nations as part of its effort to help communities on the entire continent possess critical infrastructure.

"This battery energy storage solution solves many problems," says Viljoen.

"These problems are not only [present] in South Africa," he said. "It's much worse in other areas of Africa. So, it's a huge social responsibility to deliver the basics for communities throughout Africa." "

Viljoen expressed hope that NEC XON will further increase its global competitiveness and drive the supply of infrastructure in Africa, saying: "We want to expand our international capability and be a major player in the African continent for the supply of energy and battery storage solutions."

Related Links:

*1: <https://nec.xon.co.za/>

*2: [Eskom warns of 5 more years of load-shedding – or worse](#)

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at NEC XON