Sierra leone energy storage for renewable energy

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These issues are exacerbated by rapidly increasing populations. According to the UN, by 2100 Africa’s population could reach 4.7 billion, making up 40% of the forecast global population. In comparison, populations across the continent grow faster than infrastructure development, leading to issues such as overcrowding, pollution and resource depletion in urban areas. These growing populations will require more power in order to increase productivity, reduce poverty and improve the infrastructure challenges that urban areas face.

Sierra Leone is currently faced with a challenging energy backdrop. There is a low access rate to energy nationwide, with only 26% of the total population of 7.5 million people having access to electricity – approximately 5% access in rural areas and 70% access in urban centres, including Freetown, the capital and largest city in the country. Only seven out of the 15 major towns are electrified.

The energy mix is unbalanced and unsustainable, with its continuing dependency on thermal generation. There is an existing hydropower facility at Bumbuna, in northern Sierra Leone, which generates 50MW of hydropower and supplies electricity primarily to Freetown and two other large towns: Makeni and Magburaka. However, the Bumbuna hydropower is seasonal, with a peak production of 50MW for about three months during the wet season from July to September, and a drastic reduction to 8MW by February/March each year. The dry season is marked by severe power cuts and extensive load-shedding.

In addition to inadequate and unbalanced generation capacity, commercial and technical losses in the transmission and distribution network contribute to an inefficient sector. Total line losses are estimated at approximately 40%.

The World Bank created a tool called RISE (Regulatory Indicators for Sustainable Energy) which was developed to monitor the status of the policy framework needed to advance renewable energies. There are three RISE country scores (0-33, 34-66 and 67-100) and seven categories of a policy framework being:

However, since then there has been a significant shift in relation to the following indicators: (1) a legal framework for renewal technologies, (2) planning for an expansion into the renewable sector, (3) incentives and regulatory support for renewable energies and (6) counterparty risk mitigation.

More recently, the government, working with the World Bank, started developing the National Electrification Strategy and Plan (NEP) which includes the National Online Digital Electrification Platform (NODE) to aid in this process. NODE has identified over 20000 settlements with varying access to electricity. The NEP will determine the availability of natural resources and facilitate feasibility studies, clear policy direction and targets for the use of renewable energies.

There are significant costs associated with carrying out technical studies and developing these technologies, so the use of private partnerships with investment and competence will be crucial to Sierra Leone's transformation.

As is common in West Africa, private investors, infrastructure lenders and development banks will need to be convinced that doing business in Sierra Leone, especially business that requires large investment up-front, is cost-reflective and sustainable. Sierra Leone will need to continue to develop policy and financial de-risking measures that inspire the confidence of investors. Only once it does so will Sierra Leone experience the transformative potential of the adoption of renewable technologies.