Energy storage for resilience freetown

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Power lines downed by hurricanes and wildfires. Power outages during heat waves leave millions to suffer in darkness. Our newsfeeds explode with these scenes almost daily. From generation, to transmission and distribution (T& D), to end-user demand, no part of the electricity grid is immune to the impacts of climate change. Power system operators around the world are racing to build system resilience to climate change. But how?

Strengthening power system climate resilience also requires investment in infrastructure. Deciding when and where to invest though is complex, even more so in countries or geographies where local data is scarce and risk assessment depends on an ability to work with global data and climate change models.

To assess climate change risk and recommend adaptations, Tetra Tech evaluated the vulnerability of each part of the country"s power system based on a set of criteria that define exposure, sensitivity, and adaptive capacity. Once the vulnerabilities of a specific infrastructure were identified, Tetra Tech defined and prioritized the adaptation options to address the potential risks to that infrastructure.

Using historical and projected climate data from the World Bank Climate Change Knowledge Portal, Tetra Tech modeled two climate change scenarios: a moderate one (SSP2-4.5) and a severe one (SSP5-8.5). Parameters included average annual precipitation, largest five-day cumulative precipitation, maximum temperature, and number of hot days (T > 35?C). For a granular assessment of climate change impacts, Tetra Tech used the climate projections tool from the ECOWAS Observatoryfor Renewable Energy and Energy Efficiency.

These efforts resulted in a snapshot of two climate change scenarios in Sierra Leone. In Scenario 1 (moderate / SSP2-4.5), precipitation will increase across the country between 2030 and 2070, mainly in the northern and southern regions. In Scenario 2 (severe / SSP5-8.5), precipitation will decrease slightly between 2030 and 2050 and temperature, number of consecutive dry days, and number of hot days will increase for the whole country, with intensity varying by region.

For Sierra Leone, the Power Sector Infrastructure Feasibility Study will bolster plans to safeguard the stability of the country"s economy by helping decision makers protect the electricity grid in the face of unprecedented climate change challenges.

Yvonne Aki-Sawyerr, Mayor of Freetown and Co-Chair of the C40 Cities Network, delivered the third Global Development Hub Annual Lecture at Imperial, focusing on the future of urban resilience and climate adaptation.

The Global Development Hub fosters equitable partnerships with collaborators in least developed and

lower-income countries, enhancing research and innovation"s impact on global development challenges.

Previous speakers at the annual lecture series include Amina Mohamed, Deputy Secretary-General of the UN, and Agnes Kalibata, President of AGRA, an African-led organisation dedicated to revolutionising the continent’s agricultural sector, and formerly UN Special Envoy on Food Systems.

This year’s lecture comes ahead of the launch of Imperial Global Ghana, a regional hub in Accra supporting research, education, and innovation across West Africa. Imperial Global Ghana will mark a significant step in Imperial’s expanding network of African partners from academia, government, industry and civil society, driving collaborative research and co-creation of solutions to key global challenges.

Yvonne Aki-Sawyerr has been a transformative leader in Freetown, Sierra Leone, spearheading initiatives that have significantly impacted urban development, environmental stability and community resilience. Her innovative approach to governance and sustainable urban planning has gained international recognition, making her a leading voice in the global conversation on sustainable cities.

In the Hub’s Annual Lecture, Yvonne addressed the challenges that cities face in the 21st-century, particularly in developing countries. She highlighted the challenges of rapid urbanisation in Freetown, focusing on the need for sustainable planning, reforestation and addressing the impacts of climate change and rural-urban migration.

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Web: https://www.sumthingtasty.co.za/contact-us/
Email: energystorage2000@gmail.com
WhatsApp: 8613816583346