

Kongres Container

Hybrid energy storage power generation in Sierra Leone



Overview

Does Sierra Leone have hydropower?

Hydropower Hydropower is a major energy source, holding great promise for Sierra Leone, which possesses several rivers that could be exploited for electricity [36,37]. According to the power sector master plan of Sierra Leone, the country's hydroelectric power potential is estimated to be approximately 2000 MW [38,39].

How much does electricity cost in Sierra Leone?

Currently, the selling price of electricity in Sierra Leone is USD 0.853/kWh, but this is expected to increase within the shortest possible time if the town continues to obtain its electricity supply through DGs. However, with the introduction of RES, the selling price will remain the same or further reduce due to the decrease in O&M cost.

What is a hybrid energy storage system (BESS)?

The proposed hybrid system is composed of a solar PV, wind turbine, diesel engine, and battery storage system, as indicated in Figure 5. This study comprises renewables such as solar and wind and non-renewables such as diesel generators. Since renewable sources are uncertain, a battery energy storage system (BESS) is included.

How to improve rural electrification in Sierra Leone?

Therefore, the government of Sierra Leone, with support from international partners, has launched several schemes and programs aiming at improving rural electrification, such as the chiefdom mini-grids electrification project, barefoot solar electrification project, seven districts headquarter towns electrification project, etc.

How much power does Sierra Leone have?

According to the power sector master plan of Sierra Leone, the country's

hydroelectric power potential is estimated to be approximately 2000 MW [38,39]. These are mainly concentrated in the northern and eastern parts of the country. Currently, the country has five mini hydroelectric power stations ranging from 120 kW to 50 MW.

Is a hybrid PV/wind/DG system a viable option for Lungi electricity supply?

Looking at the current constraints in supplying electricity in Lungi through the use of DGs, this work, therefore, recommends a hybrid PV/wind/DG and battery system for future semi-urban and rural electrification projects in Sierra Leone.

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