

South sudan energy storage for load shifting

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Electricity can be generated in two main ways: by harnessing the heat from burning fuels or nuclear reactions in the form of steam (thermal power) or by capturing the energy of natural forces such as the sun, wind or moving water.

Electricity production tends to closely match demand, which in turn is driven by economic and population growth and changes to the structure of the economy.

Unlike other energy commodities such as coal, oil and natural gas, electricity trade between countries is relatively limited as it is more technically complex and requires a direct cross-border interconnection. Such connections can help to balance out supply and demand across regions, which will be increasingly important as variable renewables like solar and wind make up a larger share of electricity generation.

Power generation, which includes electricity and heat, is one of the largest sources of CO2 emissions globally, primarily from the burning of fossil fuels like coal and natural gas in thermal power plants.

Growth in electricity demand has slowed down or even reversed in many advanced economies due to energy efficiency efforts and the shift towards less energy-intensive forms of economic activity, such as services. But it is still growing rapidly in many emerging market and developing countries, especially those where a significant fraction of the population still lacks access to electricity.

Electricity is primarily used for heating, cooling, lighting, cooking and to power devices, appliances and industrial equipment. Further electrification of end-uses, especially transportation, in conjunction with the decarbonisation of electricity generation, is an important pillar of clean energy transitions.

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As South Sudan emerges from the wreckage of civil war, its leaders are beginning to build the nation's electric sector from the ground up. With only a handful of oil-fired power plants and crumbling poles and wires in place, the country is striving for a system that runs primarily on renewable energy and reaches more homes and businesses.

Today, only about 1 percent of South Sudan's 12.5 million people can access the electric grid, according to the state-run utility. Many people use rooftop solar arrays or noisy, polluting diesel generators to keep the lights



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on; still many more are left in the dark. Those who can access the grid must pay some of the highest electricity rates in the world for a spotty and unreliable service.

Recently, development banks and foreign companies have started backing projects to revitalize infrastructure and boost power generation amid a relatively tranquil time for the eight-year-old country. Most of the new investment has focused in and around Juba--the nation's capital and largest city, with some 403,000 residents.

"There"s a lot of wealth that is coming with the peace now," said Jacob M. Deng, director of planning and projects for South Sudan Electricity Corporation, the nation"s sole electric utility.

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