

# South Sudan energy storage and applications

Why is energy infrastructure underdeveloped in South Sudan?

Partly due to the civil wars(e.g.,1955-1972,1983-2005 &2013-present), energy infrastructure remains very underdeveloped in South Sudan. Despite a peace agreement in 2015, which has been revitalized recently, conflict has impeded the country's effort in transitioning to renewable energy.

## What is South Sudan's role as a power utility?

Its role as a power utility is expected to intensify as programmes to increase electricity access in South Sudan are implemented. It is proposed under the Electricity Bill 2015 as the regulatory entity for the electricity sector in South Sudan. It would function as the energy regulator whose functions would include the creation of regulations.

### Is Sudan's Energy Sector Sustainable?

Further, Sudan's energy sector is currently subsidised by the government. Government subsidies to the sector totalled \$667 million in 2019. This represents 13.5% of total government expenditures . Financial sustainability could be achieved by introducing gradual tariff adjustments.

### How can Sudan achieve energy self-sufficiency?

Encouraging solar and wind power in the country's energy portfoliocould help Sudan achieve its goal of energy self-sufficiency. Egyptian policies such as nurturing and promoting renewable technologies and scientific research, feed-in tariffs, and tax exemptions could help Sudan achieve its objectives.

#### How can Sudan restructure its energy sector from Morocco?

One of the most useful strategies Sudan can adopt from Morocco is the use of new legislation and new policies to restructure the energy sector. This recommended adjustment could encourage future investments targeting renewable production and attract more foreign and local investors to participate in renewable production projects.

#### What is the governance of the energy sector in South Sudan?

The institutional and regulatory governance of the of-grid energy sector in South Sudan is still nascent. Table 2 below lists the major players participating in the governance of the energy industry and their positions as defined by applicable laws.

In the context of the civil war with no end in sight in South Sudan, this report outlines how a donor-led shift from the current total reliance on diesel to renewable energy can deliver short-term humanitarian cost savings while creating a longer-term building block for peace in the form of a clean energy infrastructure.

This paper proposes an optimized energy management strategy (EMS) for photovoltaic (PV) power plants



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with energy storage (ES) based on the estimation of the daily solar energy production.

We examined numerous optimization methods and dispatch mechanisms for energy storage that capitalize on battery-operated PV systems" monetary worth. We also discuss the grid-connected PV system-related power quality and control technology challenges.

Renewable energy sources are becoming popular in recent years due to their dependability, sustainability, and affordability. This study looked at the potential for renewable energy in South Sudan and its benefits and challenges.

South Sudan faces a serious energy crisis due to a number of factors, including devastating conflicts (e.g. 1955-172, 1983-2005 & 2013-present) and reliance on the fossil fuel source. The country has the lowest energy consumption rate in Africa and the highest cost of

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By combining an energy storage system and an integrated ECO Controller TM --Atlas Copco"s Energy Management System (EMS)-- with low-emission modular assets, such as solar and other renawable sources, you can decarbonize your operations, while achieving significant fuel, energy and lifecycle savings.

developing areas. Energy self-sufficiency has been defined as total primary energy production divided by total primary energy supply. Energy trade includes all commodities in Chapter 27 of the Harmonised System (HS). Capacity utilisation is calculated as annual generation divided by year-end capacity x 8,760h/year. Avoided

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