



South Sudan Solar Report

Prepared by J.v.G. Technology GmbH

J.v.G. Technology GmbH is a German engineering company specializing in turnkey solar module production lines and manufacturing consulting, with project experience ranging from 20 MW to 500 MW per production line, including multi-line and gigafactory projects exceeding this scale.

This Solar Report is part of the **PVKnowHow** Knowledge Network.
The data, analysis, and conclusions in this document are based on real research, consulting insights, and international solar market data.

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Gain comprehensive insights into the statistics and metrics surrounding the solar production industry in South Sudan

KEY POINTS

All figures have been converted into USD



Yearly sunshine (sun hours per year)

Average yearly sunshine in hours:

- January: 265 hours
- February: 310 hours
- March: 380 hours
- April: 420 hours
- May: 480 hours
- June: 550 hours
- July: 620 hours
- August: 590 hours
- September: 490 hours
- October: 410 hours
- November: 300 hours
- December: 250 hours



kWh per kWp installed

kWh generated per kWp:

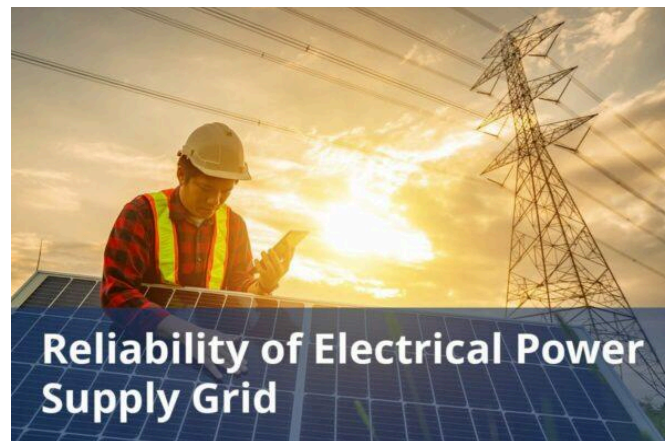
- In winter months: 90 kWh/kWp
- In spring months: 150 kWh/kWp
- In summer months: 220 kWh/kWp
- In autumn months: 130 kWh/kWp



Average cost per kWh from utility company

Average cost of electricity:

- Residential: \$0.120/kWh
- Commercial: \$0.140/kWh
- Industrial: \$0.110/kWh



Reliability of electrical power supply grid

System reliability:

- Expected downtime: 1.5%
- Availability rate: 98.5%
- Maintenance required: 2 hours/month



DETAILED INFORMATION

All figures have been converted into USD

Total solar panel production capacity (installed)

Total solar panels installed:

- As of 2023: 500,000 panels
- Projected additional installations: 150,000 panels

Total solar panel production capacity (projected)

Projected total solar panels:

- 2025 projection: 700,000 panels
- 2030 projection: 1,000,000 panels

Average costs of various electricity generation sources (coal, natural gas, solar, etc)

Average costs associated with solar installation:

- Residential setup: \$15,000
- Commercial setup: \$60,000

Percentages of various electricity generation sources (coal, natural gas, solar, etc)

Percentages of electricity generation from solar:

- Total renewable: 25%
- Solar contribution: 15%
- Wind contribution: 10%

Average daily availability of electricity from the national grid (measured in hours)

Daily availability of solar energy:

- Peak generation period: 10 AM to 4 PM
- Average daily generation: 5 kWh

Number of residential solar panel installations

Number of residential solar panels:

- Average per household: 20 panels
- Total households with solar: 25,000

Total number of solar farms (installed and projected)

Number of solar farms:

- Operational: 50 farms
- In development: 10 farms

Off-grid market demand for solar panels (current and projected)

The off-grid solar panel market in South Sudan is thriving, driven by the urgent need for dependable and sustainable energy solutions in a country where electricity access is severely limited.

Recognizing this, the government, in collaboration with international organizations such as the World Bank, is prioritizing the expansion of off-grid and mini-grid solutions to enhance electricity access, particularly in remote and rural areas.

The country's abundant solar potential, combined with advancements in technology and the decreasing costs of solar PV systems, is further fueling this growth. As a result, off-grid solar energy is becoming an increasingly vital component of South Sudan's energy landscape, offering a beacon of hope for communities in need of reliable and sustainable power.

On-grid market demand for solar panels (current and projected)

South Sudan is witnessing a surge in demand for on-grid solar panels as the country strives to enhance its electricity supply and decrease its dependence on fossil fuels.

Several large-scale solar projects have recently been launched, including Ezra Construction's Solar Project, a 26 MW solar power plant in Juba, completed in collaboration with Aptech Africa. Additionally, the Nesitu Solar Farm, a 20 MW solar farm near Juba, is being constructed by El Sewedy Electric in partnership with the Ministry of Energy and Dams, along with a 35 MWh storage system.

Furthermore, three smaller rural mini-grid systems, with capacities of 1.5 MW, 0.8 MW, and 0.8 MW, were installed in Yei, Kapoeta, and Maridi, respectively.

Although these systems, operated by rural electric cooperatives, were damaged during the conflict, efforts are underway to restart the grids, with their current status awaiting clarification.

Not specified but, expected to grow with government incentives and decreasing technology costs.

Average monthly income of workers in solar industry (labor cost)

Estimated salary for solar industry is not available specifically due to lack of data. However, average monthly salary of an individual is approximately \$300 to \$1000 (USD) (based on potential employment for 20 to 30 days a month).

Population of the country

The current population of South Sudan is 11283700.

Average overhead costs of solar panel production (with a brief breakdown)

For individuals or businesses seeking industrial space in South Sudan, rental price information is not readily available.

However, a promising lead is the Warehousing Logistics Company (WLC) – South Sudan, the country's largest warehouse company.

To inquire about rental prices and other details, interested parties can visit the WLC website at (<https://www.wlc-ssd.com/>) to access contact information and reach out to their team directly.

A summary of the energy infrastructure

Nearly all of the capacity was from fossil fuel sources, and a marginal amount was from solar power sources.

Total electricity generation in South Sudan was 0.6 billion kWh in 2021, nearly all of which was from fossil fuel sources.

South Sudan's electricity transmission infrastructure is currently limited, with a 32 MW line from Sudan to the Renk substation being underutilized due to the lack of additional transmission infrastructure.

Although proposed interconnection lines with neighboring countries such as Ethiopia, Uganda, and Sudan are being explored, they remain in the feasibility stages. The country's vast size and low population density pose significant challenges to developing a national grid, making isolated systems a more viable option.

In Juba, the 33 MW Ezra diesel power plant supplies power through a 132kV network, serving approximately 29800 connections.

Some of the government regulations surrounding solar panel production

In South Sudan, there are no specific laws or regulations solely dedicated to solar panel production. However, general regulations

concerning renewable energy projects and investments are in place, aiming to promote the use of renewable energy sources.

The government has shown interest in developing renewable energy through various initiatives and partnerships, especially in light of the country's reliance on diesel generators and the high cost of electricity.

Investment Promotion Act (2009): This act encourages investment in various sectors, including renewable energy. It offers incentives such as tax exemptions and repatriation of profits to attract foreign investors.

Public Private Partnership (PPP) Framework: This framework supports the development of infrastructure projects, including those in the renewable energy sector, through collaborations between the public and private sectors.

Government initiatives in solar panel production (includes investments and subsidies)

South Sudan has been making strides in solar energy initiatives, aiming to harness the power of the sun for a greener and more sustainable future. Here are some notable efforts:

Second Nationally Determined Contribution (SNDC): The country's transition to a low-carbon economy is prioritized in its second Nationally Determined Contribution (SNDC).

The South Sudan National Electricity Policy (SSNEP) outlines the framework for the Electricity Supply Industry (ESI) and encourages Public-Private Partnerships (PPPs).

The IOM has significantly increased its use of solar power across South Sudan. For instance, they manage a solar plant that supplies electricity to the Humanitarian Hub in Malakal.

By generating solar power, they reduce the carbon footprint and even trade carbon credits on the international market.

Notable solar projects in the country (installed and projected)

Installed Projects

- Project 1: Aptech Africa Solar PV Systems
- Installed capacity: 2.4 MW
- Location: Key health facilities across South Sudan, including: Kator Primary Health Care Center, Alsaba Children's Hospital, Juba Teaching Hospital, Rumbek State Hospital, Torit State Hospital, Kuajok State Hospital, Yambio State Hospital
- Total installed solar capacity: 726.62 kWp
- Battery bank storage: 1.677 MWh
- Project 2: 26MW Solar Farm near Juba
- Installed capacity: 26 MW
- Location: Central Equatoria, South Sudan
- Project cost: \$45 million
- Financed by: Aptech Africa was selected to render engineering procurement construction services for the solar PV power project.
- Includes: Huawei Technologies supplied 108 inverters to the project site.

Some of the notable solar companies (plus brief details on what they do)

Sun Gate Solar Solutions

- Website: <https://www.sungatesolarsolutions.com/>
- Services
 - Home/Office and Pay-As-You-Go Solar: Solar solutions for households and small offices with flexible payment options.
 - Commercial and Institutional Solar: Solar energy systems for businesses and institutions.
 - Microgrids and Metrogrids: Stand-alone power systems for communities and larger areas.
- MECH ENERGY LTD
- Website: <https://mechenergyltd.com>
- Services
 - Solar Power Systems
 - Solar water heating
 - Solar water pumping



ABOUT THIS REPORT

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All market data, analysis, and conclusions follow JvG's internal consulting standards and international PV market research practices.

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<https://www.pvknowhow.com/solar-report/south-sudan/>

About J.v.G. Technology GmbH

J.v.G. Technology GmbH is a European engineering and advisory specialist for solar production lines and manufacturing equipment, supporting investors and operators with market, location and production-focused decision frameworks.

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