Aloe Energy

COUNTRY REPORT · NOVEMBER 2026

South Sudan: grid and electricity access

Eastern Africa Power Pool

8.1 M
people live without night-time light, a proxy for no power

16%
of them live within 15 km of a power line

227
km of high-voltage lines, 66 kV and above

164
MW of operating power plants, 10 MW and above

3
power plants and transmission lines planned or under construction

About 8.1 million people in South Sudan live where satellites see no electric light at night, and 16% of them live within 15 km of a power line. This page brings together what our open atlases show for South Sudan: about 227 km of high-voltage lines, 164 MW of power plants and the projects still to come.

WHAT THIS MEANS

Uganda–South Sudan 400 kV (Olwiyo–Nimule–Juba) is 8 years behind the date first promised.



Map: Aloe Energy EAPP grid atlas. Lines © OpenStreetMap contributors (ODbL).

NEAR THE GRID, NOT ON IT

About 8.1 million people in South Sudan, roughly 68% of the population, live where satellites see no electric light at night. Of them, 16% live within 15 km of a mapped or predicted power line: 373,000 within 2 km, 923,000 2 to 15 km away, and 6.8 million farther out. The largest group lives more than 15 km from any line, where standalone solar and mini-grids are the realistic first step for years to come.

- Within 2 km of a line: **373,000** (5%)
- 2 to 15 km: **923,000** (11%)
- More than 15 km: **6.8 million** (84%)

"Without night-time light" is a satellite proxy, not a measured access rate.

THE GRID TODAY

South Sudan's mapped high-voltage network runs to about 227 km of lines at 66 kV and above, with 1 substations. The highest voltage on the map is 220 kV, and 42% of the line length runs at 220 kV or more. Installed capacity was about 230 MW (2024). The latest international tracking report puts access to electricity at 5% of people.

Mapped line length

Voltage	km
220 kV	96
Voltage not recorded	131
Total	**227**

PLANTS AND PIPELINE

Four operating power plants of 10 MW and above add up to about 164 MW, 72% of it oil. The largest is Paloch Oil Field power plant (85 MW, oil). Another 1 plant totaling about 1,080 MW is under construction or planned.

Operating capacity by type



Oil: **118 MW** (72%) Solar: **46 MW** (28%)

Promised and now expected dates

Project	Type	MW	First promised	Now expected
Uganda-South Sudan 400 kV (Olwiyo-Nimule-Juba)	Line	-	2020	2028
Ethiopia-South Sudan 230 kV (Gambella-Malakal)	Line	-	not set	2030

EMISSIONS

In 2024, each megawatt-hour used in South Sudan came with about 0.75 tonnes of CO2, including imports. The table also gives the combined margin used for carbon projects.

Grid emission factor, 2024 (tCO2/MWh)

Measure	tCO2/MWh
Generated in country	0.749
Electricity used, with imports	0.749
Combined margin (for carbon projects)	0.654

SECOND LIFE

Between 2026 and 2040, about 1,100 tonnes of solar equipment and stationary batteries are expected to retire in South Sudan, most of it off-grid solar kits and mini-grids. That is 0.2% of the total for the 49 countries in our second-life atlas.

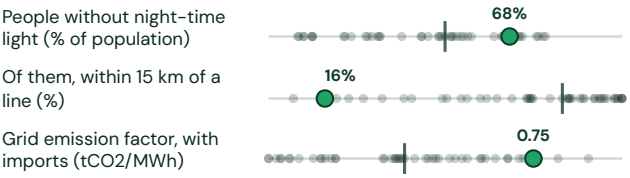
Solar and batteries retiring each year (tonnes)



CLEAN ENERGY CERTIFICATES

I-REC status: issuing. 1 registered plants, 0.7 MW. Issued so far: 2.4 GWh, of which - in 2026.

HOW IT COMPARES



Each dot is one country with a page on aloeenergy.org; the line marks the median. Positions only, no ranking.

Sources: Grid lines: OpenStreetMap contributors (ODbL), gap-fill from the World Bank Africa grid (2017); power plants: Global Energy Monitor (September 2026), WRI and public project sources; capacity and access: regulators, utilities and Tracking SDG7 2026; people and distance to the grid: WorldPop 2020 and gridfinder (CC BY 4.0); second life: Aloe second-life model (central case); emission factor: Aloe grid emission factors (Ember).

Aloe Energy

The full page, with the interactive atlas, is at aloeenergy.org/countries/south-sudan. The maps are free to view; the data behind them is available on request: brandon@aloeenergy.org. Aloe Energy is a not-for-profit initiative working on energy access across Africa, with open grid maps and data from Southern and Eastern to West and Central Africa.

Scan for the live page and map

Cite as: Aloe Energy (2026). South Sudan country report, November 2026. aloeenergy.org/countries/south-sudan. Free to share under CC BY 4.0.

FULL DATA

More about South Sudan

Everything else our research pages show for this country, from published sources. Each section names the page where the method and sources are.

PRICES AND RELIABILITY

LIT BUT OFF THE MAP

Where the lights are and the map is not

Satellites see 94 lit places in South Sudan at night. 11 are within 2 km of a mapped line, 4 are 2 to 10 km away and 79 are 10 km or more from any mapped line. Places lit far from the map point to lines the map is missing, mines and plants with their own power, or mini-grids.

The lit places off the map cover about 499 km² and are home to about 1,879,038 people.

Lit places by distance to a mapped line

Distance	Lit places	Newly lit
Within 2 km of a mapped line	11	
2 to 10 km away	4	4
10 km or more	79	48

See them on the map: the "Lit but off the map" layer of the grid-edge atlas (aloeenergy.org/research/grid-edge).

CIRCULAR AND MOBILITY

WASTE TO WEALTH

Power from waste

South Sudan's sugar mills, landfills, sewage works, factories and crop residues could make about 4 MW of power that is not built yet (central case), avoiding about 34,425 t of CO2e a year.

Power from waste by source (MW, central case)

Source	MW
Landfill gas and biogas	0.4
Crop and sawmill residues	3.9

Every site, costs and the method: power from waste (aloeenergy.org/research/waste-to-energy).

SECOND LIFE

Who could use a second-life panel

Places in South Sudan that could use a second-life solar panel add up to about 694 MWp (range 307 to 1,557): 617 MWp to cut generator use in towns, 47 MWp for mini-grids, 21 MWp for household systems and 9.3 MWp for 1,558 health facilities and 1 schools with no light at night.

Mapped by half-degree cell, with years to 2040: where the panels are needed (aloeenergy.org/research/second-life#where-demand).

E-MOBILITY

Electric transport, per km

On South Sudan's grid, an electric motorbike emits about 52 g of CO2 per km from the power it charges with, against 48 g for a petrol one (9% more, because of how this grid makes its power).

CO2 per km from use (g)

Vehicle	Electric	Petrol or diesel	Difference
Motorbike	52	48	+9%
Bus	969	1,673	-42%
Small car (newer petrol car)	156	125	+25%

Life-cycle figures, a cost calculator and city air: e-mobility (aloeenergy.org/e-mobility#per-km).

Sources: Lit places: NASA Black Marble night lights, compared with our mapped lines (grid-edge atlas). Power from waste: FAOSTAT, Global Energy Monitor and OpenStreetMap sites, in our waste-to-energy model. Second-life demand: grid-edge screening, compact targets, World Bank Enterprise Surveys and health and school facility lists, in our second-life atlas. Transport per km: our grid emission factors and vehicle energy use; running costs from national pump prices and tariffs.