Aloe Energy

COUNTRY BRIEF · NOVEMBER 2026

South Africa: grid and electricity access

Southern African Power Pool

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

98%
of them live within 15 km of a power line

82,409
km of high-voltage lines, 66 kV and above

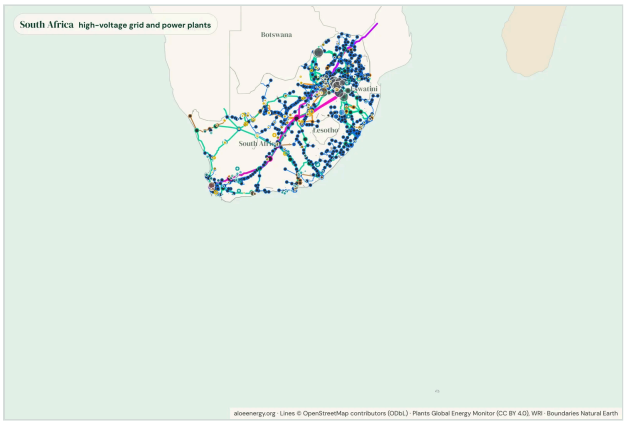
67,042
MW of operating power plants, 10 MW and above

137
power plants and transmission lines planned or under construction

About 6.3 million people in South Africa live where satellites see no electric light at night, and 98% of them live within 15 km of a power line. This page brings together what our open atlases show for South Africa: about 82,409 km of high-voltage lines, 67,042 MW of power plants and the projects still to come.

WHAT THIS MEANS

2.8 million people without power live 2 to 15 km from a line: close enough to plan for the grid, too far for a quick connection.



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

NEAR THE GRID, NOT ON IT

About 6.3 million people in South Africa, roughly 10% of the population, live where satellites see no electric light at night. Of them, 98% live within 15 km of a mapped or predicted power line: 3.3 million within 2 km, 2.8 million 2 to 15 km away, and 129,000 farther out. The largest group lives within 2 km of a line, so the main gap is last-mile connections and affordability, more than new lines.

- Within 2 km of a line: **3.3 million** (53%)
- 2 to 15 km: **2.8 million** (45%)
- More than 15 km: **129,000** (2%)

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

THE GRID TODAY

South Africa's mapped high-voltage network runs to about 82,409 km of lines at 66 kV and above, with 2,411 substations. The highest voltage on the map is 765 kV, and 42% of the line length runs at 220 kV or more. In August 2026, SAPP reported a peak demand of 27,582 MW against 32,510 MW available.

Mapped line length

Voltage	km
765 kV	2,800
500 kV	1,401
400 kV	21,597
275 kV	7,511
220 kV	1,264
132 kV	26,933
110 kV	2
88 kV	10,770
66 kV	5,700
Voltage not recorded	4,430
Total	**82,409**

PLANTS AND PIPELINE

There are 197 operating power plants of 10 MW and above, adding up to about 67,042 MW, 69% of it coal. The largest is Kusile power station (4,800 MW, coal). Another 137 plants totaling about 53,956 MW are under construction or planned, 4,352 MW of them under construction.

Operating capacity by type



Coal: **46,104 MW** (69%) Solar: **6,010 MW** (9%)
Wind: **4,316 MW** (6%) Hydro: **3,558 MW** (5%)
Other: **7,053 MW** (11%)

EMISSIONS

In 2024, each megawatt-hour used in South Africa came with about 0.82 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	0.819
Electricity used, with imports	0.819
Combined margin (for carbon projects)	0.811

SECOND LIFE

Between 2026 and 2040, about 282,600 tonnes of solar equipment and stationary batteries are expected to retire in South Africa, most of it solar panels. That is 68.5% of the total for the 18 countries in our second-life atlas.

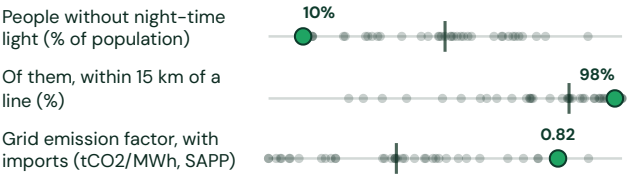
Solar and batteries retiring each year (tonnes)



CLEAN ENERGY CERTIFICATES

I-REC status: issuing. 133 registered plants, 6,701 MW (solar 2,305, wind 2,238, nuclear 1,940, bioenergy 201, hydro 17). Issued so far: 15.9 TWh, of which 3.9 TWh 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; supply and demand: SAPP monthly report; 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-africa. 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 at the grid edge in Sub-Saharan Africa.

Scan for the live page and map

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