Aloe Energy

COUNTRY BRIEF · NOVEMBER 2026

Zambia: grid and electricity access

Southern African Power Pool

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

85%
of them live within 15 km of a power line

13,477
km of high-voltage lines, 66 kV and above

5,993
MW of operating power plants, 10 MW and above

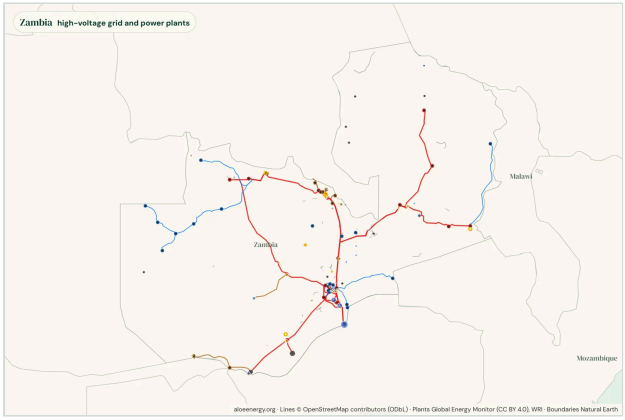
64
power plants and transmission lines planned or under construction

Zambia runs mostly on hydropower, so its power supply rises and falls with the rains: the 2024 drought cut output at the big dams and brought long daily power cuts. About 12 million people still live where satellites see no electric light at night, yet 85% of them live within 15 km of a power line. For many families the grid is close, but not close enough. That makes Zambia a strong case for mini-grids built to join the grid later, and for more solar beside the hydro.

Our paper Power first, grid next looks at Zambia's network in detail. It counts about 2 million people at 2 to 15 km from the grid, about a third of the grid-edge figure on this page: the paper uses a stricter Zambia-only method (mapped medium-voltage transformers and a threshold for what counts as lit), while this page uses one method for all 39 countries. Both are kept.

WHAT THIS MEANS

To reach 100% electricity access by 2030, Zambia needs to add about 7 percentage points a year from 2023: from 54% today.



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

NEAR THE GRID, NOT ON IT

About 12 million people in Zambia, roughly 54% of the population, live where satellites see no electric light at night. Of them, 85% live within 15 km of a mapped or predicted power line: 3.5 million within 2 km, 6.3 million 2 to 15 km away, and 1.8 million farther out. The largest group lives 2 to 15 km out: close enough to plan for the grid, too far for a quick connection. That is where mini-grids built to join the grid later can do the most good. At its 2016-2023 pace, about 2.0 percentage points a year (World Bank), Zambia would reach the 100% access target in its Mission 300 compact around 2047, not 2030; the target needs about 7.0 points a year.



Within 2 km of a line: **3.5 million** (31%)
2 to 15 km: **6.3 million** (54%)
More than 15 km: **1.8 million** (15%)

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

THE GRID TODAY

Zambia's mapped high-voltage network runs to about 13,477 km of lines at 66 kV and above, with 169 substations. The highest voltage on the map is 330 kV, and 41% of the line length runs at 220 kV or more. About 394 km come from older World Bank (2017) maps, used where OpenStreetMap has gaps. In August 2026, SAPP reported a peak demand of 2,734 MW against 3,129 MW available.

Mapped line length

Voltage	km
330 kV	4,667
220 kV	660
132 kV	1,666
88 kV	713
66 kV	4,595
Voltage not recorded	782
Gap-fill from older public maps	394
Total	**13,477**

PLANTS AND PIPELINE

There are 35 operating power plants of 10 MW and above, adding up to about 5,993 MW, 71% of it hydro. The largest is Kariba Dam hydroelectric plant (2,130 MW, hydro). Another 59 plants totaling about 15,273 MW are under construction or planned, 1,960 MW of them under construction.

Operating capacity by type



Hydro: **4,281 MW** (71%) Solar: **1,157 MW** (19%)
Coal: **330 MW** (6%) Oil: **185 MW** (3%)
Other: **40 MW** (1%)

MISSION 300 COMPACT

Zambia's Mission 300 energy compact commits to raising electricity access from 54% to 100% by 2030. New access is planned as 45% grid, 10% mini-grids and 45% standalone solar.

Electricity access



Now: **54%** (2023) Target: **100%** (2030)

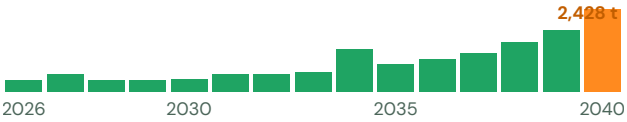
Mission 300 energy compact

Commitment	Value
Planned split of new access	grid 45%, mini-grids 10%, standalone solar 45%
Clean cooking target	from 9% to 40% by 2030
Private investment sought	US$9.5 billion
Rules for mini-grids when the grid arrives	Yes
E-waste commitment	Mentioned only

SECOND LIFE

Between 2026 and 2040, about 13,300 tonnes of solar equipment and stationary batteries are expected to retire in Zambia, most of it solar panels. That is 3.2% of the total for the 18 countries in our second-life atlas.

Solar and batteries retiring each year (tonnes)



EMISSIONS

In 2024, each megawatt-hour used in Zambia came with about 0.19 tonnes of CO2, including imports. The table also gives the combined margin used for carbon projects.

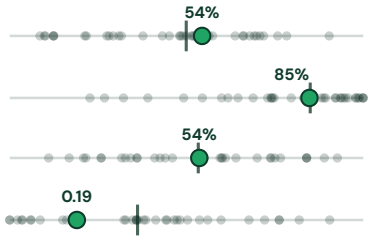
Grid emission factor, 2024 (tCO2/MWh)

Measure	tCO2/MWh
Generated in country	0.190
Electricity used, with imports	0.190
Combined margin (for carbon projects)	0.083

CLEAN ENERGY CERTIFICATES

I-REC status: issuing. 12 registered plants, 2,905 MW (hydro 2,858, solar 48). Issued so far: 81 GWh, of which 22 GWh 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 (ERB Zambia Energy Sector Report 2023, Tables 3-2, 3-3, 3-6); compact: the national Mission 300 energy compact.

Aloe Energy

The full page, with the interactive atlas, is at aloeenergy.org/countries/zambia. 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.

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