Aloe Energy

REGIONAL REPORT · NOVEMBER 2026

Southern African Power Pool (SAPP)

Every country side by side, from public data

12
countries in our data

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

74%
of them live within 15 km of a power line

97,331
MW of operating power plants, 10 MW and above

9
countries with a Mission 300 compact in our data

The Southern African Power Pool (SAPP) side by side: power plants and lines, the generation mix, Mission 300 compacts, prices, carbon, access, drought risk, storage and waste for each country, with a pool total. About 383 million people live in the 12 countries in our data; our atlases map about 97,331 MW of operating plants and 155,422 MW more planned or under construction.

Formed in 1995, it brings together the twelve mainland SADC countries. It runs a competitive day-ahead power market.

GRID AND GENERATION

GRID AND GENERATION

Power plants, lines and the generation mix

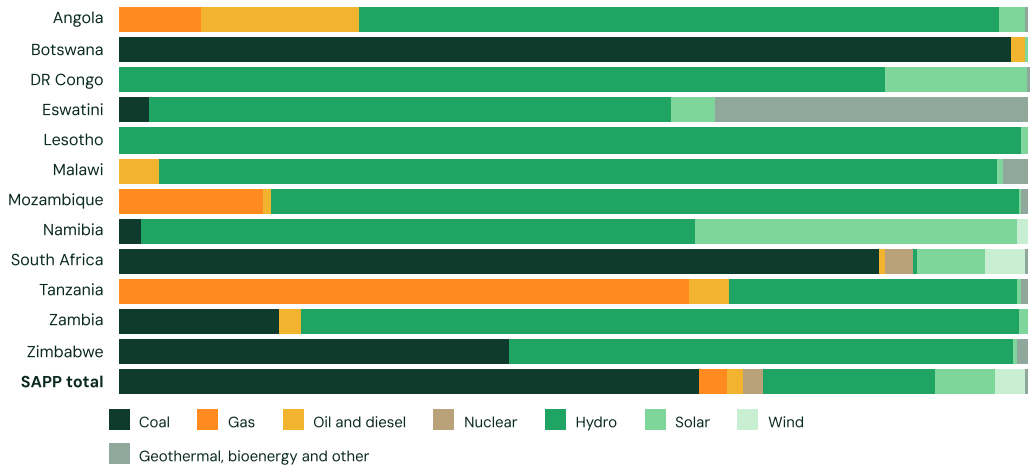
Across the 12 SAPP countries in our data, our atlases map about 97,331 MW of operating power plants of 10 MW and above (coal 51%, hydro 24%, solar 9%), about 20,201 MW under construction and about 135,221 MW more planned. Hydro is the largest source in 8 of the 12 countries.

The mapped high-voltage network runs to about 163,501 km of lines.

Power plants and lines by country

Country	Operating (MW)	Largest source	Under construction (MW)	Planned (MW)	Lines (km)	Top voltage	Substations
Angola	6,329	Hydro (64%)	2,197	5,315	7,023	400 kV	56
Botswana	1,012	Coal (72%)	700	4,585	7,808	400 kV	64
DR Congo	3,884	Hydro (84%)	398	3,601	9,846	500 kV	142
Eswatini	202	Biomass (47%)	0	574	1,113	400 kV	18
Lesotho	102	Hydro (71%)	0	340	636	132 kV	24
Malawi	565	Hydro (62%)	431	1,476	2,700	400 kV	40
Mozambique	2,992	Hydro (73%)	944	19,913	9,745	500 kV	70
Namibia	869	Solar (41%)	7,417	16,727	11,536	400 kV	60
South Africa	67,042	Coal (69%)	4,352	49,604	82,409	765 kV	2,411
Tanzania	3,870	Hydro (75%)	402	8,148	9,206	400 kV	64
Zambia	5,993	Hydro (71%)	1,960	13,313	13,477	330 kV	169
Zimbabwe	4,473	Hydro (48%)	1,400	11,626	8,003	400 kV	81
SAPP total	**97,331**	**Coal (51%)**	**20,201**	**135,221**	**163,501**		**3,199**

Generation mix by country



Electricity generation by source, 2024

Country	Generation (TWh)	Coal	Gas	Oil and diesel	Nuclear	Hydro	Solar	Wind	Geothermal, bioenergy and other
Angola	15.6	–	9%	17%	–	71%	3%	–	–
Botswana	3.4	98%	–	1%	–	–	–	–	–
DR Congo	15.9	–	–	–	–	84%	16%	–	–
Eswatini	0.6	3%	–	–	–	57%	5%	–	34%
Lesotho	0.5	–	–	–	–	99%	1%	–	–
Malawi	1.8	–	–	4%	–	92%	1%	–	3%
Mozambique	19.8	–	16%	1%	–	82%	–	–	1%
Namibia	1.6	2%	–	–	–	61%	35%	1%	–
South Africa	247.6	84%	–	1%	3%	–	7%	4%	–
Tanzania	8.8	–	63%	4%	–	32%	–	–	1%
Zambia	13.6	18%	–	3%	–	79%	1%	–	–
Zimbabwe	10.3	43%	–	–	–	56%	–	–	1%
SAPP total	**339.6**	**64%**	**3%**	**2%**	**2%**	**19%**	**7%**	**3%**	**–**

Capacity and peak demand, latest published

Country	Capacity (MW)	Peak demand (MW)	As of
Angola	6,382	2,186	Oct 2022
Botswana	475	698	August 2026
DR Congo	1,650	2,379	August 2026
Eswatini	60	229	August 2026
Lesotho	76	206	August 2026
Malawi	580	452	Aug 2026
Mozambique	2,186	1,085	August 2026
Namibia	490	672	August 2026
South Africa	32,510	27,582	August 2026
Tanzania	3,092	1,944	2025
Zambia	3,129	2,734	August 2026
Zimbabwe	1,505	1,693	August 2026

Cross-border line projects we track: 3 completed, 3 under construction, 14 in preparation

Countries	Voltage	Status	Year
Kenya-Tanzania	400 kV	Completed	2024
Rwanda-Burundi-Tanzania	220 kV	Completed	2024
Republic of the Congo-DR Congo	220 kV	Completed	–
Mozambique-Malawi	400 kV	Under construction	2026 (expected)
Rwanda-DR Congo	220 kV	Under construction	2027 (expected)
Burundi-DR Congo	220 kV	Under construction	2028 (expected)
Angola-Namibia	400 kV	In preparation	2029 (expected)

Countries	Voltage	Status	Year
Uganda-Tanzania	400 kV	In preparation	2029 (expected)
DR Congo-Rwanda-Burundi	220 kV	In preparation	2030 (expected)
Malawi-Zambia	400 kV	In preparation	2030 (expected)
Uganda-DR Congo	220 kV	In preparation	2030 (expected)
Zimbabwe-Zambia-Botswana-Namibia	330 kV	In preparation	2030 (expected)
Republic of the Congo-Angola	400 kV	In preparation	2032 (expected)
Angola-DR Congo	-	In preparation	-
Angola-Namibia	400 kV	In preparation	-
Botswana-Namibia	-	In preparation	-
DR Congo-Angola	-	In preparation	-
Mozambique-Tanzania	-	In preparation	-
Zambia-Angola	-	In preparation	-
Zambia-DR Congo	330 kV	In preparation	-

Capacity is what the country or SAPP reports (available capacity in the SAPP monthly report, installed capacity elsewhere); it is not the same as our mapped plants. GEM marks the plant total from Global Energy Monitor where no national figure is published. The project table lists lines in our project tracker; older interconnectors are on the atlas and the interconnector limits (aloeenergy.org/research/interconnector-limits) page. Every plant and line: the SAPP grid atlas (aloeenergy.org/research/sapp-grid).

MISSION 300 COMPACTS

MISSION 300 COMPACTS COMPARED

What the compacts say, side by side

9 of the 12 SAPP countries in our data have published a Mission 300 national energy compact. Together they seek about US$50.2 billion of private investment by 2030. 1 set out how to handle e-waste from solar kits and batteries, and 3 say what happens to mini-grids when the main grid arrives.

No compact in our data: Angola, Eswatini, South Africa.

Set the split beside the access section below, which shows where the people without power live by distance to a mapped line: a compact that relies on the grid fits a country where most of them live within 2 km.

Access targets and how they are split

Country	Access now	Target	Grid	Mini-grid	Standalone	What the split measures
Botswana	76.6% in 2025	100% by 2030	-	-	-	Not split
DR Congo	21.5% in 2024	62% by 2030	44%	56%	0%	Share of new connections
Lesotho	53% in 2024	100% by 2030	58%	2%	40%	Share of new connections
Malawi	25.9% in 2023	70% by 2030	30.1%	2.6%	37.4%	Share of people with access
Mozambique	60.1% in 2024	100% by 2030	-	-	-	Not split
Namibia	59.5% in 2023	70% by 2030	-	-	-	Not split
Tanzania	46% in 2022	75% by 2030	-	-	-	Not split
Zambia	53.6% in 2023	100% by 2030	45%	10%	45%	Share of new connections
Zimbabwe	41% in 2024	100% by 2030	62%	1%	38%	Share of new connections

What each compact commits to

Country	Productive use	E-waste	Least-cost or GIS plan	Mini-grid rules when the grid arrives	Cost-reflective tariff	Private investment sought (US$ billion)
Botswana	Mentioned	No	Planned	Mentioned	Committed	Not stated
DR Congo	Mentioned	No	Exists	Yes	Committed	20
Lesotho	Yes	No	Exists	Mentioned	Committed	1.5
Malawi	Mentioned	Yes	Exists	Mentioned	Committed	1.6
Mozambique	Mentioned	No	Exists	Mentioned	Committed	8.7
Namibia	Mentioned	No	Exists	Not stated	Committed	0.4
Tanzania	Mentioned	No	Exists	Mentioned	Committed	4.0
Zambia	Mentioned	Mentioned	Exists	Yes	Committed	9.5
Zimbabwe	Mentioned	No	Exists	Yes	Committed	4.4

Read from each compact document, with page numbers and quotes for every value: Mission 300 compacts compared (aloeenergy.org/research/m300-compacts). "Not stated" means the compact does not say.

PRICES AND CARBON

PRICES

What power costs across the pool

Household tariffs are the energy charge at the central bank exchange rate; check on the tariffs page what each includes. Our power price data holds 25 deals in SAPP countries, from auctions, signed power purchase agreements and published bids.

The SAPP day-ahead market cleared at an average of 5.6 US cents per kWh in August 2026.

Household tariffs and load shedding

Country	Utility	Household (US$/kWh)	Lifeline or first block (US$/kWh)	Load shedding
Angola	ENDE	0.015	0.004	No data
Botswana	Botswana Power Corporation (BPC)	0.116	0.056	Cuts reported
DR Congo	SNEL	0.089	0.039	Cuts reported
Eswatini	Eswatini Electricity Company (EEC)	0.172	0.094	No data
Lesotho	Lesotho Electricity Company (LEC)	0.125	0.056	No data
Malawi	ESCOM	0.070	0.046	Cuts reported
Mozambique	EDM	0.103	0.017	None reported
Namibia	City of Windhoek	0.146	-	No data
South Africa	Eskom	0.168	0.141	None reported
Tanzania	TANESCO	0.111	0.038	None reported
Zambia	ZESCO	0.049	0.017	Not confirmed this month
Zimbabwe	ZETDC	0.160	0.080	Cuts reported

Power deals signed or bid in the pool, US$/MWh as signed

Source	Deals	Median	Lowest	Highest
Solar PV	7	69	25	90
Coal	5	68	59	110
Hydro	5	35	6	84
Diesel and fuel oil	2	380	260	500
Gas	2	162	105	220
Battery storage	1	120	-	-
Imports across a border	1	170	-	-
Mixed dispatchable bids	1	106	-	-
Wind	1	34	-	-

Every tariff and status with its source: utilities, tariffs and load shedding (aloeenergy.org/research/utilities-and-tariffs). Every deal with its source: power prices and deals (aloeenergy.org/research/power-prices). Load shedding is grouped from the status we last read for each country.

CARBON

Grid carbon and carbon markets

5 of the 12 SAPP countries in our data issue I-REC renewable energy certificates, about 19.9 TWh to date. The grid factor is the average CO2 per MWh of electricity used; a low factor means grid power, electric transport and new grid connections add little CO2.

Grid carbon, certificates and carbon markets

Country	Grid factor (tCO2/MWh)	Year	I-REC certificates	Issued to date (GWh)	Article 6 deals and activities	Net CO2 avoided by new connections (t a year)
Angola	0.177	2024	Not approved	-	0	-18,122
Botswana	0.905	2024	Approved, none issued	-	0	-39,865
DR Congo	0.061	2024	Issuing	11	0	174,106
Eswatini	0.473	2024	Not approved	-	0	409
Lesotho	0.364	2024	Approved, none issued	-	0	44,562

Country	Grid factor (tCO2/MWh)	Year	I-REC certificates	Issued to date (GWh)	Article 6 deals and activities	Net CO2 avoided by new connections (t a year)
Malawi	0.033	2024	Not approved	-	6	23,728
Mozambique	0.086	2024	Not approved	-	0	-14,448
Namibia	0.445	2024	Issuing	56	0	1,587
South Africa	0.819	2024	Issuing	15,866	0	-382,290
Tanzania	0.358	2024	Not approved	-	4	-441,814
Zambia	0.190	2024	Issuing	81	6	-23,373
Zimbabwe	0.465	2024	Issuing	3,861	2	-202,777

Methods: grid emission factors (aloeenergy.org/research/grid-emission-factors), clean energy certificates (aloeenergy.org/research/clean-energy-certificates) and carbon per connection (aloeenergy.org/research/carbon-per-connection) (central case, new connections to 2030 under each compact or national target). A negative value means the new connections add CO2 on net, because the grid power they use emits more than the kerosene and diesel they replace.

ACCESS, RISK, STORAGE AND WASTE

ACCESS

Who lives near the grid but not on it

About 202 million people in the SAPP countries in our data live where satellites see no electric light at night, out of about 383 million. 74% of them live within 15 km of a mapped power line, and 29% within 2 km, close enough for a grid connection to be the obvious first step.

Satellites also see 10,319 lit places 2 km or more from any mapped line: missing lines, mines and plants with their own power, or mini-grids.

People without power and how far they live from the grid

Country	People (million)	Without night light (million)	Within 2 km of a line	2 to 15 km	Beyond 15 km	Median distance (km)	Lit places off the map
Angola	38	16	26%	47%	27%	7.2	315
Botswana	2.5	0.3	32%	52%	15%	4.1	316
DR Congo	109	83	30%	30%	40%	7.7	160
Eswatini	1.2	0.3	72%	28%	0%	0.9	169
Lesotho	2.3	1.1	32%	56%	12%	3.7	45
Malawi	22	15	35%	63%	2%	3.2	284
Mozambique	35	20	21%	53%	26%	7.4	559
Namibia	3.0	1.5	44%	49%	8%	2.5	250
South Africa	64	6.3	53%	45%	2%	1.9	5,490
Tanzania	69	35	26%	59%	15%	4.6	1,756
Zambia	21	12	31%	54%	15%	4.5	109
Zimbabwe	17	12	28%	61%	11%	4.5	866
SAPP total	**383**	**202**	**29%**	**45%**	**26%**		**10,319**

Night-time light is a proxy for no power, not a household survey. Map and method: the grid-edge atlas (aloeenergy.org/research/grid-edge).

RISK, STORAGE AND WASTE

Drought, battery sites, waste and second life

A dry year that takes a fifth of hydro output would cost the SAPP countries about 1,659 MW on average over the year, and a severe drought (two fifths) about 3,322 MW. 50 coal, gas and oil plant sites with about 57,917 MW of grid connection could host batteries as they close. Waste could fuel about 1,328 MW of power, and about 356,556 t of solar panels, kits and batteries will reach end of life from 2026 to 2040.

Drought risk, storage sites, waste and second life

Country	Hydro in operating plants	Dry year, MW lost	Severe drought, MW lost	Thermal plant sites for batteries (MW)	Power from waste (MW)	Solar and battery waste 2026-2040 (t)	Second-life panel demand (MWp)
Angola	63%	278	556	929	100	6,754	4,012
Botswana	-	-	-	802	2	3,963	182
DR Congo	84%	302	605	-	124	10,405	5,416
Eswatini	35%	7	15	-	88	239	98

Country	Hydro in operating plants	Dry year, MW lost	Severe drought, MW lost	Thermal plant sites for batteries (MW)	Power from waste (MW)	Solar and battery waste 2026–2040 (t)	Second-life panel demand (MWp)
Lesotho	71%	11	23	–	1	476	90
Malawi	62%	39	77	–	56	2,630	728
Mozambique	73%	366	732	658	70	26,339	1,153
Namibia	24%	23	47	120	7	6,330	71
South Africa	5%	54	108	52,379	538	274,364	2,495
Tanzania	68%	66	131	804	177	6,358	3,562
Zambia	65%	382	765	405	92	13,306	1,551
Zimbabwe	32%	131	263	1,820	73	5,392	786
SAPP total		**1,659**	**3,322**	**57,917**	**1,328**	**356,556**	**20,144**

Methods: hydro and drought (aloeenergy.org/research/hydro-exposure), power plant to battery site (aloeenergy.org/research/thermal-to-storage), power from waste (aloeenergy.org/research/waste-to-energy) and the second-life atlas (aloeenergy.org/research/second-life). Central cases throughout.

SOURCES AND METHOD

- Plants and lines: our grid atlases (Global Energy Monitor, WRI, OpenStreetMap, World Bank and national sources). Generation mix: Ember. Capacity and peak demand: SAPP monthly report and national regulators and utilities.
- Compacts: the published Mission 300 national energy compacts and World Bank compact progress reports. Distances: our grid-edge atlas.
- Tariffs and load shedding: utility tariff books, regulators and news reports (Utilities and Tariffs data). Deals: auction results, regulators, utilities and trade press (power prices data).
- Grid factors: Ember and national data, in our grid emission factors. Certificates: the I-REC registry (Evident). Article 6: UNEP-CCC Article 6 pipeline.
- Access: WorldPop population, NASA Black Marble night lights, Google Open Buildings and our mapped lines (grid-edge atlas).
- Hydro: our grid atlases and Ember. Thermal sites: Global Energy Monitor (September 2026). Waste: FAOSTAT, Global Energy Monitor and OpenStreetMap. Second life: IRENA, compact targets and our second-life atlas.

Rows run in alphabetical order. These are side-by-side facts, not scores or rankings. A dash means we hold no data for that country. Pool totals count member countries only.

Aloe Energy

Country detail, maps and the data behind every table: aloeenergy.org/regions/sapp. Aloe Energy is a nonprofit that publishes open energy maps and data for Africa. Free to share under CC BY 4.0.