

Africa Outlook Report 2022

By Informa Markets
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The Africa Outlook

The future of African power markets



Data driven by Informa's business intelligence partner ABiQ

There is a huge gap between supply and demand for electricity across the continent, but also a significant funding gap. As it becomes harder for fossil fuel schemes to raise funding, more attention is being given to renewable energy opportunities across the continent.

Africa is a chronically underpowered part of the world. Across the continent, some 844TWh of electricity was generated in 2020, just 3.1% of the global total, according to data compiled by BP, even though Africa is home to around a fifth of the world's population. More than half the total was generated in just two countries: South Africa with 240TWh and Egypt with 199TWh.

That leaves most countries with relatively little power, particularly in sub-Saharan Africa where fewer than 47% of people had access to electricity in 2019, according to the most recent data from the World Bank. The situation is far worse in rural areas, where just 27% had access, compared to 83% in urban areas.

North African markets and a few of the more developed, smaller economies are better placed. Mauritius, Seychelles, Egypt and Tunisia all had 100% access and Morocco and Algeria were not far behind. Among the continent's biggest economies, South Africa had 85% access, while Kenya was at 70% and Nigeria was at just 55%. At the bottom of the league table is South Sudan, with an access rate of just 6.7% and Chad with 8.4%.



Financial challenges

The shortage of electricity in many markets provides plenty of opportunities, but they tend to be accompanied by numerous difficulties too, from political instability and other governance issues to economic ones such as unreliable access to hard currency to pay for imports of vital equipment. These challenges mean that private sector capital is often in short supply and, as a result, funding for power projects in Africa often relies on public sector sources.

From 2000 to 2019, Africa received \$109bn in public commitments in the energy sector, \$50bn of which came in 2010-2019, according to the International Renewable Energy Agency (IRENA). Of the total, almost \$64bn was for renewable energy projects, including large hydropower schemes. Most of the capital was provided by international donors, including other governments and development finance institutions (DFIs), using a combination of debt and grants.

The ranks of regular supporters include countries such as China, France, Germany and the UK; multilateral development banks such as the World Bank and the African Development Bank (AfDB); and DFIs such as FMO of the Netherlands and KfW of Germany.

However, far more is needed. According to the G20's Global Infrastructure Outlook programme, some \$1.9 trillion is needed to fund investment in African energy infrastructure between 2018 and 2040, but based on current trends just \$1.6 trillion is likely to be forthcoming, leaving an investment gap of some \$244bn.

Climate change issues

The reliance on foreign donors has placed some African governments in a difficult political position, given the momentum at the global level to address climate change issues by cutting back on the use of fossil fuels.

The most important source of energy in Africa is bioenergy. Biofuels and waste account for more than 40% of total energy supply around the continent, according to Abu Dhabi-based IRENA, with some 927m people relying on these sources for cooking and heating.

When it comes to electricity generation, for many years coal was the dominant source of fuel, but in 2012 it was overtaken by natural gas for the first time. To this day, coal and gas remain the two most important sources of electricity. Along with oil, these three fuels account for around 80% of electricity generation across the continent as of 2019, according to IRENA's estimates.

However, cutting the use of such fossil fuels is a key priority for many of the countries which help to fund African infrastructure projects. This was clearly seen at the 26th UN Climate Change Conference of the Parties (COP 26) summit in Glasgow, UK in November 2021. African countries argued that they should be allowed to continue to rely on gas and other fossil fuels for electricity generation while

they made a “just transition” to low-carbon energy, but many of the world’s richest countries took a different approach.

At the summit some 34 countries – including France, Germany, the UK and the US – committed themselves to end their support for fossil fuel energy projects by the end of 2022, “except in limited and clearly defined circumstances”. That pledge was made in a joint Statement on International Public Support for the Clean Energy Transition, which was also signed by five powerful development banks, including the European Investment Bank, FMO and the East African Development Bank. Furthermore, the signatories said they would encourage other governments, export credit agencies and public finance institutions to sign up to similar commitments in the years ahead.

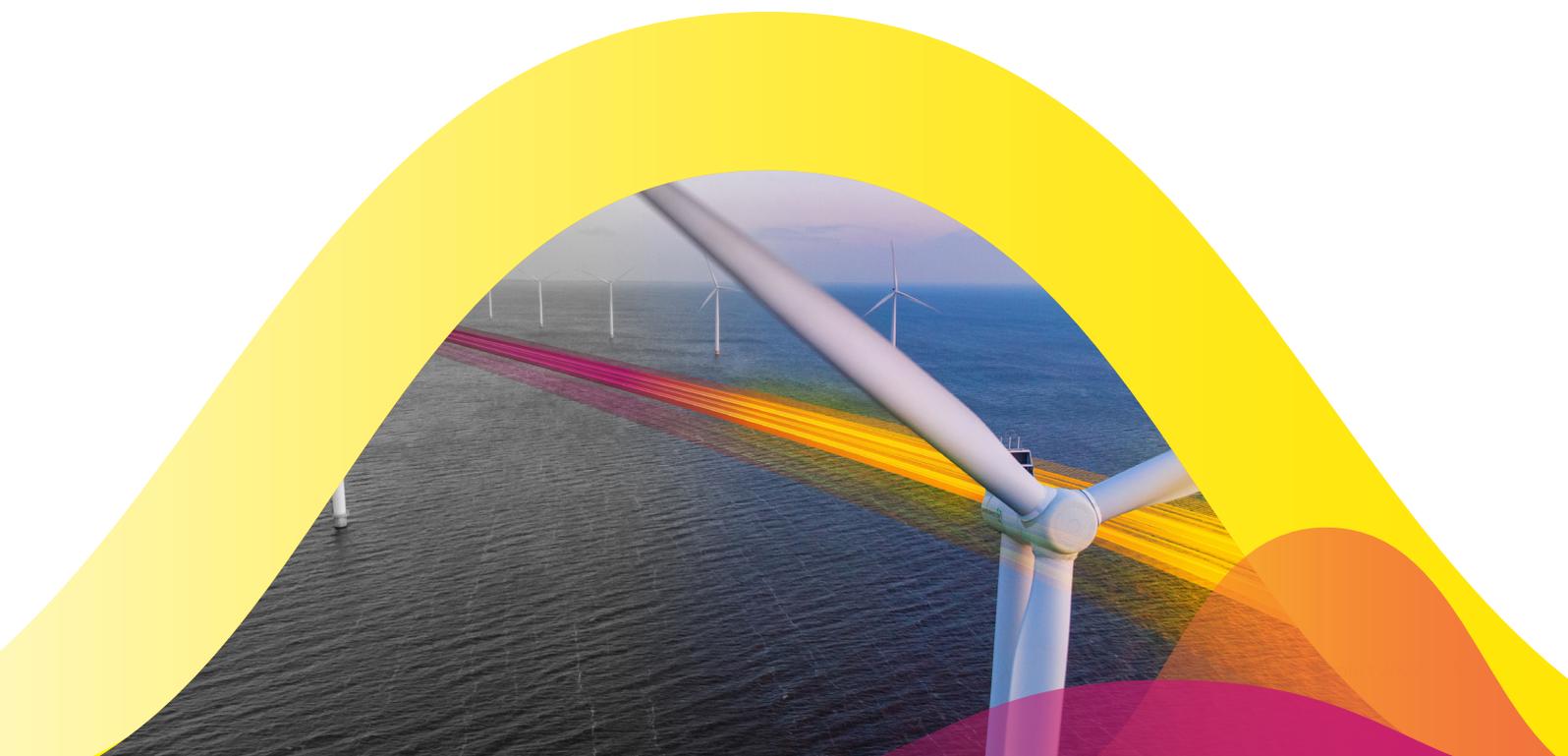
That creates a challenge for African countries that desperately need to expand their electricity generating capacity but face a narrower range of financing options.

Renewable projects

Renewable energy projects could benefit from the changing financing landscape. Across the continent, clean energy sources are being developed at a rapid pace, albeit from a low base, including solar, wind, hydroelectric and geothermal.

Renewable generation, excluding hydropower, has risen from less than 10TWh in 2013 to more than 42TWh by 2020, according to IRENA. The largest economies are again the most active, with South Africa and Egypt the leading players, accounting for more than half the continent-wide total. Wind power plants provided 21.8TWh in 2020, while solar generation accounted for 12.4TWh and biomass for 8.1TWh.

The installed electricity generating capacity of solar power plants shot up from 194MW in 2010 to 9.5GW a decade later. Wind power capacity has also increased massively, from 846MW in 2010 to 6.5GW in 2020. Geothermal power – a specialism of Kenya and, to a more limited extent, Ethiopia – has gone from 205MW to 831MW over the same time period.



A few other countries around the East Africa Rift System have also been examining the potential of geothermal energy. The Kenya Electricity Generating Company (KenGen) began drilling geothermal wells in Djibouti in November 2021 and the Tanzania Geothermal Development Company has set out plans to develop up to 200MW of geothermal energy there by 2025.

Hydropower is more common, notably in eastern Africa. However, some countries may be at risk of being overly reliant on this power source. Until recently, Malawi was getting 98% of its power from water flowing from Lake Malawi. However, when water levels drop, so does the amount of power that can be generated. As a short-term fix, in 2018 the government leased diesel-fired power generation plants, but even then the 422MW total installed capacity falls far short of the 700MW demand, according to the Japan International Cooperation Agency (Jica).

In other places, hydropower has been a cause of significant geopolitical tensions, such as with Ethiopia's Grand Ethiopian Renaissance Dam (Gerd) project, which has been bitterly criticized by Sudan and Egypt, which are downriver on the Nile and concerned their water supplies may be disrupted.

In Tanzania the 2.1GW Julius Nyerere dam has attracted criticism for having a capacity far in excess of local demand or what the national grid can deal with. In Democratic Republic of Congo, the 4.4GW Grand Inga dam project has been years in the planning but there has been little progress since the World Bank stepped back from the scheme in 2016.

Also controversial is nuclear energy, although the high cost of developing atomic power means it has a minimal footprint on the continent. The only operating nuclear plant is the 1.8GW twin reactor Koeberg plant near Cape Town in South Africa. More is planned though. The South African government is considering developing a further 2.5GW of nuclear power and in Egypt there are plans to build up to four reactors at El Dabaa, west of Alexandria.

There is also huge potential for more renewable energy to be produced. According to IRENA, Africa's hydropower potential is 1,753GW, while the continent's solar PV technical potential is 7,900GW. It estimates that wind power could provide a further 461GW – with Algeria, Ethiopia, Namibia and Mozambique having the greatest potential.

The difficulty in getting projects off the ground is leading to some novel developments. Increasingly, off-grid and mini-grid power schemes are being seen in places where the grid is either too unreliable or too distant. These schemes are often based on renewable energy sources and, when combined with batteries, can provide reliable power to communities of several thousand people. Recent examples have included the International Finance Corporation (IFC)'s Scaling Mini-Grids programme in Democratic Republic of Congo and French utility company Engie's development of mini-grids on islands in Lake Victoria, Uganda.



The unreliable nature of grid electricity is also prompting some large industrial power consumers to start generating their own power, in countries where licensing conditions allow that to happen. Recent examples include 10.5MW of capacity being developed for the Seven-Up Bottling Company (SBC) in Nigeria and 185MW of capacity at mining company Zimplats' sites in Zimbabwe.

Project activity

Despite the financing, governance and other pressures confronting the industry, there is a healthy pipeline of major power schemes either underway or planned across the continent.

According to the ABiQ Markets database, there are almost 200 power plant schemes currently ongoing around the continent, ranging in size from the \$34bn Algeria Renewable Energy Development and Energy Efficiency Programme to the \$17m Blanket Mine Solar PV 29MW in Zimbabwe. In total, these projects are valued at a combined \$189bn. Many of them are relatively small – some 68 projects are valued at \$100m or less – but 60 are valued at \$500m or more, with 32 of them worth at least \$1bn.

Top 20 ongoing projects

Name	Country	Type	Value (\$m)
Algeria Renewable Energy Development and Energy Efficiency Program	Algeria	Solar	34,000
El Dabaa Nuclear Power Plant	Egypt	Nuclear	28,750
Kusile Coal Power Plant	South Africa	Coal	6,766
Mambilla Hydropower Project	Nigeria	Hydro	5,800
Karpowership Port of Coega	South Africa	Gas	5,540
Karpowership Richards Bay	South Africa	Gas	5,540
Batoka Gorge Hydroelectric Dam	Zimbabwe	Hydro	5,200
Baringo-Silali Geothermal Project	Kenya	Geothermal	5,000
Grand Ethiopian Renaissance Dam	Ethiopia	Hydro	4,800
Caculo Cabaca Hydroelectric Project	Angola	Hydro	4,500
Sengwa Coal Power Plant	Zimbabwe	Coal	4,000
Karpowership Saldanha	South Africa	Gas	3,940
South Africa Renewable Energy Project 6.8 GW Phase 1	South Africa	Wind	3,500
Rufiji Hydropower Dam	Tanzania	Hydro	2,900
Koysha Hydropower	Ethiopia	Hydro	2,800
Attaqa Mountain Pumped Storage Hydroelectric Power Pant	Egypt	Hydro	2,600
Dairut-Luxor IPP	Egypt	Gas	2,200
i-kWh IPP in Libya	Libya	Gas	2,000
High Grand Falls Dam	Kenya	Hydro	2,000
Kafue Gorge Hydroelectric Dam	Zambia	Hydro	2,000

Source: ABiQ

The most active ongoing markets are three of the largest economies on the continent. Algeria boasts \$35.92bn worth of ongoing project – mainly thanks to its ambitious renewable energy programme. Just behind it is Egypt, with \$35.9bn worth of projects – the most significant element of which is the \$28.9bn nuclear energy programme. In third place is South Africa, with \$32.7bn, including significant amounts of gas and coal-fired plants, worth \$15bn and \$6.8bn respectively.

These three countries between them account for more than half of all projects underway across Africa, but a further 40 countries have at least some work underway. Of these, 20 countries have more than \$1bn worth of ongoing power projects. At the other end of the scale, four countries – Benin, Central African Republic, Guinea-Bissau and South Sudan – have less than \$100m worth.

South Africa's pursuit of large amounts of conventional power is relatively rare across the continent. Overall, out of the \$189bn worth of ongoing projects, just \$42.5bn of them involve coal or gas-fired plants. The largest single element of project activity is solar, with 89 projects accounting for \$51.8bn worth of the total, followed by hydroelectric power (36 projects, worth a combined \$44.2bn).

There are just two nuclear plants in development – in Egypt and South Africa – but the economics of that sector mean that between them they account for some \$30bn of activity. In addition, there are 19 wind power plants under construction worth \$9.9bn, along with 11 geothermal schemes worth \$9.1bn as well as small numbers of waste-to-energy and biomass plants worth a combined \$773m.

Future activity

Beyond the projects that are currently under construction, a further \$257bn worth of projects are at various stages of planning, covering 169 schemes, according to ABIQ Markets. While these involve 37 countries in all, the planned activity is heavily concentrated in just a few large markets. Four countries account for almost half of all planned projects (48.5%): South Africa, Morocco, Uganda and Kenya. The next four largest markets count for a further 27% of overall activity: Nigeria, Democratic Republic of Congo, Egypt and Mozambique.



Top 20 planned projects

Name	Country	Type	Value (\$m)	Stage
Uganda Nuclear Power Plant	Uganda	Nuclear	25,000	Study
Morocco-UK Power Project	Morocco	Solar	22,000	Plan
Kenya Nuclear Power Plant	Kenya	Nuclear	20,000	Plan
Nseleni Independent Floating Power Plant	South Africa	Gas	20,000	Plan
Inga 3 Hydroelectric Dam	DR Congo	Hydro	18,000	Study
Al Negila Nuclear Power Plant	Egypt	Nuclear	14,000	Study
Geregu Nuclear Power Plant	Nigeria	Nuclear	10,000	Study
South Africa Second Nuclear Power Plant	South Africa	Nuclear	10,000	Plan
Grand Eweng Hydro Power Plant	Cameroon	Hydro	5,500	Study
Ghana Nuclear Power Plant	Ghana	Nuclear	5,500	Plan
Jorf Lasfar Gas to Power Project	Morocco	Gas	4,600	Pre-qualification
Luapula Hydropower Plant	Zambia	Hydro	4,300	Plan
Mphanda Nkuwa Hydroelectric Dam	Mozambique	Hydro	4,200	Design
Eskom Richards Bay Power Plant	South Africa	Gas	4,000	Plan
Tafouk 1 Solar PV	Algeria	Solar	3,600	Bidding
Makurdi Hydropower Plant	Nigeria	Hydro	3,500	Study
South Africa Renewable Energy Project 6.8 GW Phase 2	South Africa	Solar	3,500	Plan
Harmattan Wind Project	Morocco	Wind	3,000	Plan
Musina-Makhado Coal Power Plant	South Africa	Coal	2,669	Study
Chemba Hydropower Project 1,000 MW	Mozambique	Hydro	2,550	Study

Source: ABIQ



By value, the most significant element of planned activity is nuclear power, which accounts for \$84.5bn of the total, with \$35.5bn at the planning stage and a further \$49bn at the study stage. Six countries are currently weighing up nuclear power schemes: Egypt, Ghana, Kenya, Nigeria, South Africa and Uganda. Hydropower projects are the next largest element, worth a total of \$54bn.

For all these plans to move from the drawing board to reality, though, will require continued access to international financing sources.

Electricity generation by type (TWh)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Eastern Africa	42	46	48	48	51	54	56	59	62	66	74
Central Africa	13	13	13	14	16	16	19	19	20	21	22
Western Africa	32	34	40	38	43	43	45	43	43	43	51
Other Northern Africa	138	150	159	169	179	194	205	218	233	245	263
Other Southern Africa	214	213	224	238	248	248	257	267	261	253	262
Total	439	457	484	505	536	556	582	606	620	627	672

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Eastern Africa	78	82	87	93	98	97	103	109	109	109
Central Africa	23	23	28	30	33	33	35	38	40	41
Western Africa	52	54	60	63	64	68	71	73	77	79
Other Northern Africa	271	300	309	322	338	341	355	366	379	370
Other Southern Africa	265	261	260	260	255	257	261	261	257	244
Total	689	721	744	768	788	797	825	847	863	844

Source: ABIQ

Renewable power installed capacity (MW)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Solar PV	11	13	15	18	22	26	34	47	63	107	194
Geothermal	65	65	65	65	135	135	135	135	135	170	205
Wind	133	133	140	150	226	226	311	452	537	724	846
Biomass	-	-	-	-	-	-	-	-	-	-	-

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Solar PV	266	323	660	1,565	1,931	2,974	4,691	7,096	8,277	9,505
Geothermal	205	213	213	373	611	645	655	671	831	831
Wind	977	1,110	1,724	2,383	3,322	3,829	4,581	5,469	5,769	6,491
Biomass	-	4	4	6	7	7	8	8	8	8

Source: ABIQ



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