CHAPTER 1

The Africa Outlook
With some 1.3 billion people, Sub-Saharan Africa is home to about a fifth of the world’s population while it accounts for just 3% of electricity use. Yet entrepreneurial savvy and an increasing diversity of power sources are gradually overcoming the limitations of the continent’s legacy infrastructure. A majority of new electricity connections in the coming years will come from off-grid solar.

The huge gap between electricity supply and demand in Africa is well known. Only a handful of countries on the continent can boast of 100% electricity access, including Egypt and Tunisia, while a few others get close, such as Mauritius, Cabo Verde and Gabon, according to data from the World Bank. Some of the larger economies, such as South Africa and Ghana, provide the vast majority of their people with power, but they are still not yet at 100% and power cuts remain a problem – particularly in South Africa where it is an increasingly important political issue.

Many other countries have much lower access, particularly in rural areas – electricity access in Mozambique, Malawi, Sierra Leone, Liberia and some other countries is well below 10% in rural areas. Across the continent as a whole, electricity access in rural areas is less than 27%, according to the African Development Bank (AfDB).

Yet the gap is gradually closing, helped by the increasing diversity of power sources. Renewable power projects are growing in size and reach and storage solutions are starting to address the intermittency of solar and wind power. New forms of financing are also being deployed to make the most of local capital.

There remain plenty of challenges. While the energy transition could allow African countries to create extensive, green energy networks, there remain numerous financial, regulatory and logistical problems that need to be overcome before the continent’s full potential can be unleashed. In the meantime, governments insist on the need to continue expanding thermal power generation capacity.

### Thermal power projects

Africa is home to some of the world’s largest producers of hydrocarbons. Nigeria, Algeria, Angola and Libya are among the world’s 20 biggest oil producers, while Algeria, Egypt and Nigeria are among the 20 largest natural gas producers. Several African countries also produce coal, most notably South Africa, but also some of its neighbours including Botswana, Mozambique and Zimbabwe.

Given that situation, it is perhaps unsurprising that coal and natural gas are the two largest sources of electricity generation across the continent, followed by hydropower and oil. The three carbon fuels in that list – gas, coal and oil – between them accounted for about 77% of Africa’s total electricity generation in 2019, according to a 2022 report by the International Renewable Energy Agency (IRENA), in collaboration with the AfDB.

While much of the world’s attention has been on the ramping up of renewable energy sources, including hydropower, wind, solar and geothermal power, there remains a strong appetite for conventional fuels, with natural gas in particular identified by many African governments as a vital ‘transition fuel’ in the continent’s journey to reach its net zero carbon emission targets. This has been the cause of some friction with international partners and, as a result, sourcing finance for gas-fuelled plants has become more difficult in recent years as western backers have shied away from such projects.
Nonetheless, there are numerous thermal power plants under development, or at least under consideration, around the continent – both in terms of new plants being built and existing plants being expanded.

A key consideration is often the need for reliable baseload power – something that wind and solar power plants cannot provide due to intermittency of those sources and the under-developed nature of existing power storage technology.

## Hydroelectric Power

According to the International Hydropower Association (IHA), there was some 33.4GW of installed hydroelectric power capacity across sub-Saharan Africa as of 2021. The most important country is Ethiopia, which has installed capacity of just over 4GW. It is followed by Angola (3.8GW), South Africa and Democratic Republic of the Congo (2.8GW).

On an electricity generation basis, the picture is slightly different, with Mozambique the leading actor with 15TWh in 2021, followed by Zambia (14.9TWh), Ethiopia (13.6TWh) and Angola (10.7TWh).

The Paris-based International Energy Agency (IEA) estimates that hydropower provided 16% of Africa’s electricity output in 2020, with 90% of the generation capacity located in sub-Saharan Africa (SSA).

Even within SSA though, the industry is concentrated in a relatively small number of countries. Just 15 countries across SSA account for more than 90% of the installed hydropower capacity and generation.

That concentration is likely to increase in the years to come. The IEA says large hydropower projects are planned in 15 countries, including existing sector-leaders such as Angola, Ethiopia, DRC, Nigeria and Tanzania. Reservoir plants make up around 83% of this project pipeline – these are more flexible in producing power and better at managing water flow than run-of-river plants, which account for 6% of the planned schemes. Another 6% are pumped storage plants.

### Selected major hydropower projects in SSA, planned or underway

<table>
<thead>
<tr>
<th>Country</th>
<th>Project</th>
<th>Capacity (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angola</td>
<td>Caculo Cabaça</td>
<td>2,172</td>
</tr>
<tr>
<td>Cameroon</td>
<td>Nachitgal</td>
<td>420</td>
</tr>
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<td>Democratic Republic of Congo</td>
<td>Grand Inga</td>
<td>40,000</td>
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<tr>
<td>Ethiopia</td>
<td>Grand Ethiopian Renaissance Dam (Gerd)</td>
<td>6,450</td>
</tr>
<tr>
<td>Nigeria</td>
<td>Mambilla</td>
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</tr>
<tr>
<td>Nigeria</td>
<td>Zungeru</td>
<td>700</td>
</tr>
<tr>
<td>Tanzania</td>
<td>Julius Nyerere</td>
<td>2,115</td>
</tr>
<tr>
<td>Zambia / Zimbabwe</td>
<td>Batoka Gorge</td>
<td>2,400</td>
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</table>

## Geothermal

Africa’s geothermal power capacity is concentrated around the East African Rift System, and in Kenya in particular. According to IRENA, Kenya currently has some 863MW in installed capacity in 2021, putting it far ahead of the next nearest country Ethiopia, which has just 7MW. Indeed, for Kenya, geothermal power is the largest single element of its electricity supply.

Where Kenya has led, others are seeking to follow, with activity in a number of nearby countries. In December, the African Development Bank Group approved a $10m grant from the Sustainable Energy Fund for Africa (SEFA) for the Tulu Moye geothermal project – a drilling programme that will add 50MW to Ethiopia’s power system, with a potential second phase adding a further 100MW.

In August 2022, the UK’s Northern Powerhouse Investment Fund (NPIF) reported that Marriott Drilling Group had raised a “seven-figure loan” from NPIF - Mercia Debt Finance to help finance its work on the construction of two geothermal power stations in Ethiopia.
The Tanzania Geothermal Development Company (TGDC), a subsidiary of the state-owned Tanzania Electric Supply Company, issued tenders in November for drilling services and equipment to be used in its Ngozi geothermal drilling programme. That is one of several sites earmarked for development around the country, as part of wider ambitions by TGDC to develop up to 200MW of geothermal capacity in the coming years.

**Off-grid, mini-grid and home systems**

With large parts of Africa far from electricity transmission lines, the trend for off-grid and mini-grid networks continues to grow. These are generally powered by fossil fuels or solar photovoltaic plants, but there are also some schemes based on power from hydroelectric, wind and biofuel sources.

According to the World Bank’s Off-grid Solar Market Trends Report 2022, some $86 million people in SSA are not connected to the grid – with the largest number being in West Africa, where 213 million are without a link. A further 182 million people around the continent have unreliable grid access.

**Electricity grid access (millions of people)**

<table>
<thead>
<tr>
<th>Region</th>
<th>Unconnected</th>
<th>Unreliable grid</th>
</tr>
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<tbody>
<tr>
<td>Central Africa</td>
<td>109</td>
<td>14</td>
</tr>
<tr>
<td>East Africa</td>
<td>161</td>
<td>41</td>
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<tr>
<td>West Africa</td>
<td>213</td>
<td>94</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>103</td>
<td>33</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>586</strong></td>
<td><strong>182</strong></td>
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</table>

The World Bank estimates that the majority of new electricity connections in the period 2020-25 will come from off-grid solar, including 53% of new connections in Southern Africa, followed by 55% in West Africa, 64% in East Africa and 81% in Central Africa.

However, the rate of growth has shown sharply divergent trends in different regions in the past few years.
**Off-grid funding**

Funding has been forthcoming for this sector. Globally, the off-grid solar sector attracted $2.3 billion of capital from 2012-2021, according to the database maintained by GOGLA, the global association for the off-grid solar energy industry.

That finance comprises a mixture of debt, equity and grants, but it has been heavily concentrated, both in geographic and commercial terms. Some 49% of funding was assigned to East Africa. In addition, seven large companies absorb the majority of investments, all of which are active in Africa. They are: Bboxx, d.light, Engie Energy Access, Sun King, Lumos, M-Kopa and Zola.

**Investment trends**

Between 2000 and 2019, $109 billion in public commitments were made to the energy sector across Africa, according to IRENA. More than half of the total – $64 billion – was directed towards renewable energy, of which $50 billion went towards hydropower projects from 2010 onwards. This is a reflection of the general trends for more finance to be directed into renewables – while the renewables sector attracted 14% of public investment in energy in 2000, by 2017 it had reached a record 79%.

A small number of investors accounted for the majority of those financial commitments, led by China (51% of the commitments), the International Bank for Reconstruction and Development (14%) and the Islamic Development Bank.

While investments in renewable energy have increased, they are unevenly distributed, with most going to the more developed economies. The top five recipients over the period were South Africa, Egypt, Nigeria, Morocco and Kenya – between them, they received more than half of all renewable investments. The 33 least-developed countries (LDCs) in Africa attracted just 32% of renewable energy commitments in Africa from 2010-19.

The discussion around financing of power projects in Africa has become inextricably linked with the global push to take action to minimise the damage from climate change. Many western financing institutions are now refusing to support oil and gas projects, or at least heavily prioritising renewable schemes. At the same time, most African governments insist that natural gas in particular must be allowed to play a role in their electricity supply industries in the short-to-medium term.

New financial frameworks continue to be drawn up, including South Africa’s $8.5 billion Just Energy Transition Partnership (JETP), which was announced at COP26 and received initial funding at COP27 last year. This scheme involves a partnership between the governments of South Africa, France, Germany, the UK, US and the EU. It aims to accelerate the decarbonisation of South Africa’s economy, helping the country transition its coal power plants to clean power. As such, the JETP offers a model which could be replicated in some other parts of the continent.

Governments are also increasingly keen to develop and tap local sources of finance, although this is not a realistic option in many parts of the continent.

The AfDB says it has a portfolio of energy projects worth more than $12 billion. Its key initiatives include the New Deal on Energy for Africa, which launched in 2016 and aims for universal energy access, with priority given to the use of low-carbon technologies. From 2016-20, the AfDB approved $7.2bn in funding under the New Deal and mobilised a further $850m in co-financing resources. Overall, this funding is expected to add 3GW of installed generation capacity, of which 2.2GW will come from renewable energy sources. The funding will also support the construction of more than 7,000km of transmission lines, including 3,000km of regional interconnections.

Other AfDB initiatives include the Desert-to-Power initiative (DtP) to accelerate economic development in the Sahel region through the deployment of solar technologies, the Sustainable Energy Fund for Africa (SEFA), and the Facility for Energy Inclusion investment platform.
The eight tables are provided courtesy of business intelligence partner ABiQ. ABiQ provides validated, verified business intelligence covering Africa and the Middle East, with unique forecasting and project tracking capabilities to monitor projects worth over $7 Trillion in 68 countries. To discuss your business intelligence needs, request a free trial (https://www.abiq.io/)

### Top 40 MEA | Utility-scale Wind Projects: proposed and awarded

<table>
<thead>
<tr>
<th>Project</th>
<th>Region</th>
<th>Country</th>
<th>Status</th>
<th>Stage</th>
<th>Value million USD</th>
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<td><strong>AFRICA</strong></td>
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<td>Aysha II Wind Power Plant</td>
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<td>Bubisa Wind 300 MW</td>
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<td>Plan</td>
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<td>Zambia</td>
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<td>South Africa REIPPP 1 Mainstream Wind 824 MW</td>
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<td>Enel-Hi-Pele 700 MW Wind Farms in South Africa</td>
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### Top 40 MEA | Utility-scale Wind Projects: proposed and awarded (contd.)

<table>
<thead>
<tr>
<th>Project</th>
<th>Region</th>
<th>Country</th>
<th>Status</th>
<th>Stage</th>
<th>Value million USD</th>
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<td>Dhofar III Wind IPP 200 MW</td>
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<td>Duqm Wind IPP 200 MW</td>
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<td>NEOM Hydrogen Power Wind</td>
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<td>Bidding</td>
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</tbody>
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### Top 15 in Africa | Geothermal power plants: proposed and awarded

<table>
<thead>
<tr>
<th>Project</th>
<th>Region</th>
<th>Country</th>
<th>Status</th>
<th>Stage</th>
<th>Value million USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baringo-Silali Geothermal Project</td>
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<td>Kenya</td>
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<tr>
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<tr>
<td><strong>AFRICA</strong></td>
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<td>Caculo Cabaça Power Transmission Project</td>
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## Top 20 in Africa | Africa hydropower projects: planning and construction

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## Top 38 MEA | Hydrogen projects: proposed and awarded

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Source: ABIQ 2023
## Top 38 MEA | Hydrogen projects: proposed and awarded (contd.)

Source: ABiQ 2023

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# Top 30 MEA | Gas-fired power plants: proposed and awarded

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## MEA | Renewable power capacity and generation

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