Investing in Energy in Africa

Beginning of a new investment cycle: the opportunistic time for an early mover with a long-term vision?

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1 Executive Summary

Investing in renewable power production in Africa presents a significant market opportunity. The continent has the lowest electricity access rate in the world, with only 60% of the population having access to electricity — and just 50% in Sub-Saharan Africa. Despite this, Africa has immense, largely untapped potential for clean energy production across various technologies, including solar PV, wind, hydropower, geothermal energy as well as battery storage. These opportunities span multiple segments, from on-grid solutions to commercial and industrial (C&I) applications and solar home systems. Currently, only 67 GW of renewable energy capacity has been installed – primarily hydropower, which accounts for just ~1% of the continent's estimated technical potential. Moreover, most of renewable power installations are concentrated in North Africa and the Republic of South Africa (RSA), while Sub Saharan Africa, which is home to 80% of the continent's population, has received only a third of these investments.[1]

As one might expect, the African continent is a complex and high-risk investment landscape. However, investors often overlook its diversity, applying uniformly high-risk ratings across all African nations – commonly referred to as the "Africa premium". At the national level, challenges include political instability, a weakening macroeconomic environment marked by rising debt levels, and increasing currency volatility. At the sector level, risks involve regulatory uncertainty and the reliability of off-takers. The "Africa premium" significantly inflates the cost of capital for renewable energy projects, while recent economic down turns have further eroded project returns. Moreover, development lead-times tend in Africa tend to be considerably longer compared to Europe, adding another layer of complexity for investors.

As a result, investment in energy in Africa has experienced a significant slowdown in the past decade, as international investors lose enthusiasm, especially in Sub Saharan Africa outside of RSA. OECD-based infrastructure and private equity (PE) funds are re-focusing on OCDE countries, while major international energy players (e.g., Engie, Enel, EDF) have shifted the focus to the three more mature African markets: RSA, Egypt, and Morocco.

European independent power producers (e.g., Akuo, GreenYellow), after an opportunistic attempt at short-term "coups", are now seeking to exit the continent to concentrate on their core markets. The African energy investment ecosystem, particularly in Sub-Saharan Africa (excluding RSA), now primarily relies on a small number of long-term players: Development Finance Institutions (DFIs), select major international players such as TotalEnergies, regional infrastructure and PE funds that have remained committed to the continent, and a handful of regional platforms that have successfully built pan-African portfolios at the gigawatt scale.

Despite this contrasting picture, the road to universal access to electricity is still expected to require significant investments in energy in the mid-term (more than USD 20 billion per year by 2030), particularly in Sub Saharan Africa. In the meantime, **E-CUBE Strategy Consultants** believes it is an opportunistic moment for an early mover to position themselves for the long-term. The coincidence of the disengagement of historical international investors and the end of PE cycles creates both a shortage of capital and opportunities for acquisition in a "buyer's market". Several project developments are currently paused, with development teams seeking funding.

[1] Excluding RSA, and excluding large historical hydropower.

Additionally, a number of favourable factors are likely to revitalise the market: the shift of DFI investments from fossil fuels to renewables, ambitious renewable energy development plans in specific countries, an increasing appetite for private capital, and the take-off of the new technologies and sectors (e.g., geothermal energy, biomass, battery storage, C&I).

To conclude, E-CUBE Strategy Consultants sees a genuine short-term window to enter this yet-to-be-competitive market with significant potential. We believe now is an ideal time for a committed investor with a long-term vision to step in. Such a move would secure a strategic position towards becoming a reference energy investor or even a clean power producer in Sub-Saharan Arica.

E-CUBE Strategy Consultants has built this conviction by supporting Taranis, the investment arm of the Perenco group, in setting up an investment fund dedicated to energy in Africa. In doing so, we have guided our client through its first transaction: the acquisition of the African team and portfolio of the French IPP Akuo.

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2 Renewable power production in Africa presents a vast market opportunity.

2.1 Access to electricity remains the lowest in the world.

Access to electricity in Africa, although it has increased approximately by 2.5 over the past 20 years, remains the lowest in the world. In 2022, only 60% of the population had access to electricity. This figure is even lower for Sub Saharan Africa[2], where only 50% of the population are electrified. This level significantly behind the global average which was close to 90% in 2022.

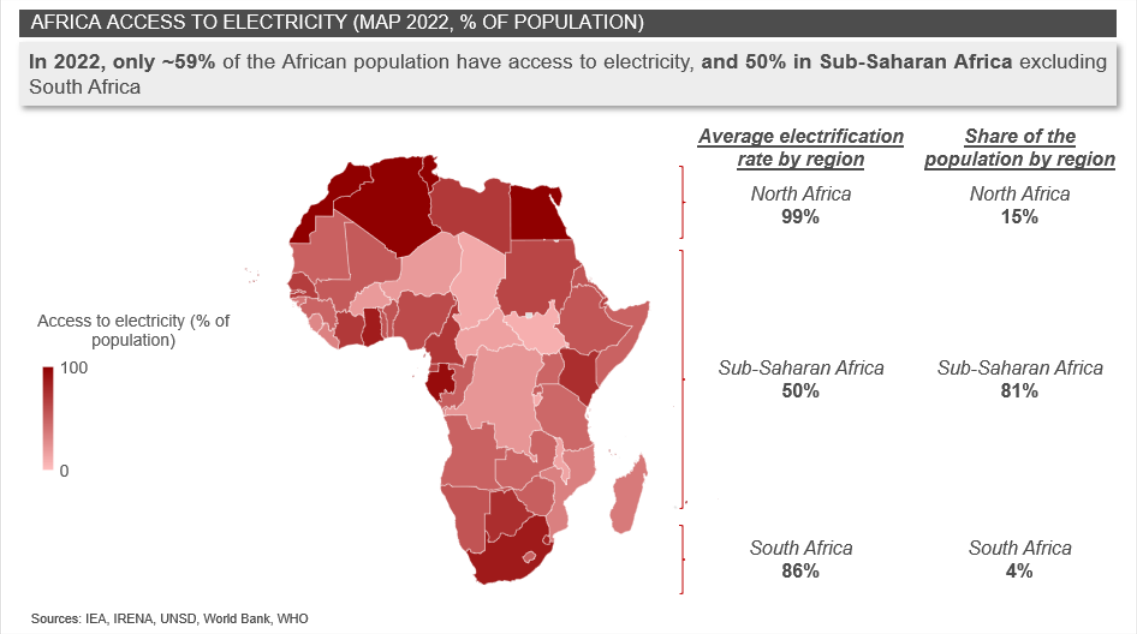

Figure 1 - Electrification levels in Africa: access to electricity by country (2022, % of the population).

Africa's power production capacity, estimated at 0.26 TW in 2023, is is significantly lower than that of other regions, such as China (2.6 TW), USA (1.2 TW), Europe (1 TW) or even India (0.5 TW). In 2023, only 26% of Africa's installed capacity was renewable (67 GW), with 41 GW located in Sub-Saharan Africa,90% of which was based on historical hydropower technologies.

[2] Excluding Republic of South Africa.

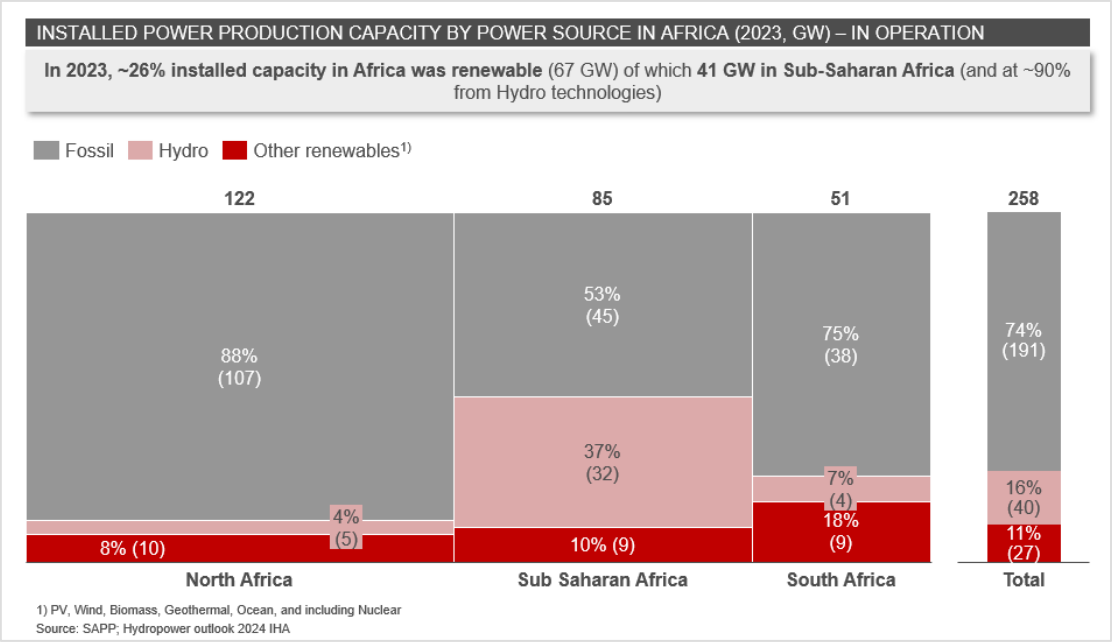

Figure 2 - Installed power production capacity by power source in Africa (2023, GW).

2.2 Africa's clean power potential is immense yet largely untapped.

Africa's clean power technical potential is estimated at approximately**9,000 TW, far** exceeding the 500 TW required by **2030 to achieved universal access to modern energy.** However, this vast potential remains largely untapped. The current installed capacity of **67 GW**, represents only around 1% of this total potential.

2.2.1 Hydropower: the most historically developed clean energy source in Africa.

Hydropower is currently the most developed renewable energy source in Africa. As of 2024, **40 GW has been installed**, accounting for approximately **60%** of the continent's renewable capacity. These installations are primarily concentrated in Central and Southern Africa and consist of mainly large, historically developed hydropower plants exceeding> 100 MW.

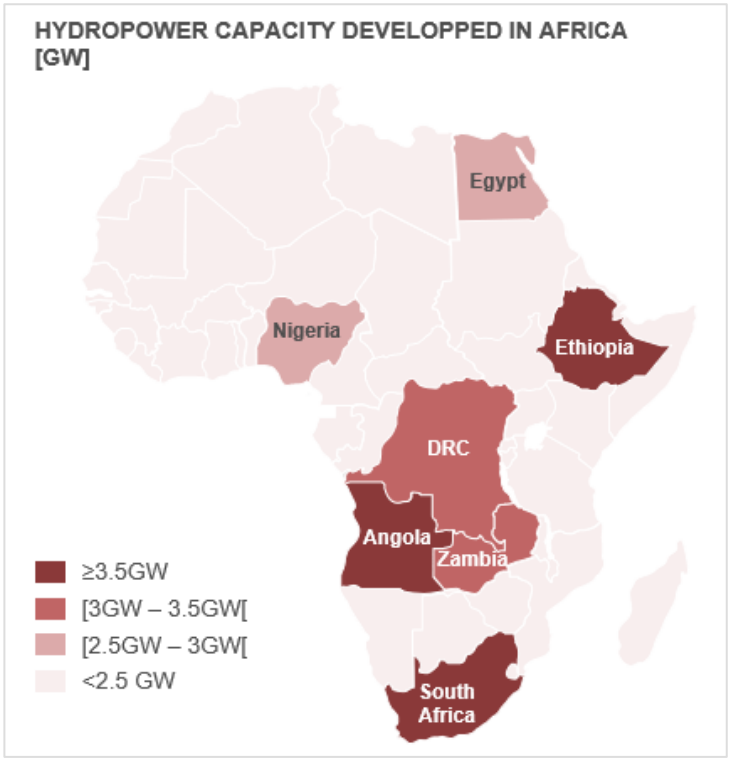

Figure 3: Hydropower capacity developed in Africa [GW].

Hydropower plants are divided in two main categories:

- **"Large hydro" refers to power production capacities above 100 MW** and up to a **few GW**, which can be either dam-based or run-of-the-river power plants. They tend to be financed by public-private-partnerships, such as the Mambilla Hydroelectric Dam in Nigeria (3GW) or Batoka Gorge Hydroelectric Dam between Zambia and Zimbabwe (2.4GW). These assets require substantial investments and have significant social and environmental impacts, resulting in very long development lead times[3].
- **"Small to medium hydro" refers to run-of-the-river power plants with capacities of** less than **10 MW** (up to 50 MW in some cases), typically developed by independent power producers.

[3] Project full development lead time can take 15 to 20 years with the examples of Nachtigal in Cameroon (20y), Bujugali in Uganda (18 years) or the Renaissance dam in Egypt (15 years) with example of construction alone lasting more than 10 years e.g.: with Ruzizi III in Burundi or Gilgel Gibe III in Ethiopia

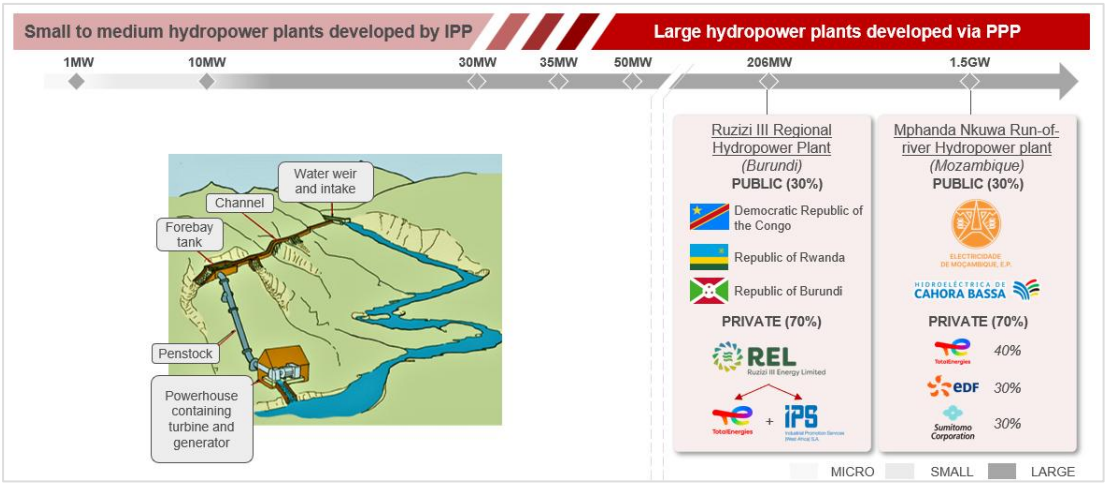

Figure 4: categories of hydropower projects in Africa.

Africa has **significant technical potential for hydropower,** estimated at **630 GW,** primarily relying on large hydropower plants. The currently installed capacity of **40 GW** represents just **6%** of this potential.

Figure 5: Hydropower capacity and potential in Africa [GW][4].

Small-scale hydropower projects, with lower CAPEX, shorter development lead-times, and reduced social and environmental impacts, are the preferred option for independent developers. The technical potential is estimated at **20 GW,** of which only **around 1 GW is currently installed.** This potential is primarily located in Central and Eastern Africa.

[4] Technical potential: maximum exploitable capacity with current technologies, excluding economic and environmental constraints; Sources: IEA's Sustainable Africa Scenario, International Hydropower Association (IHA), 2023.

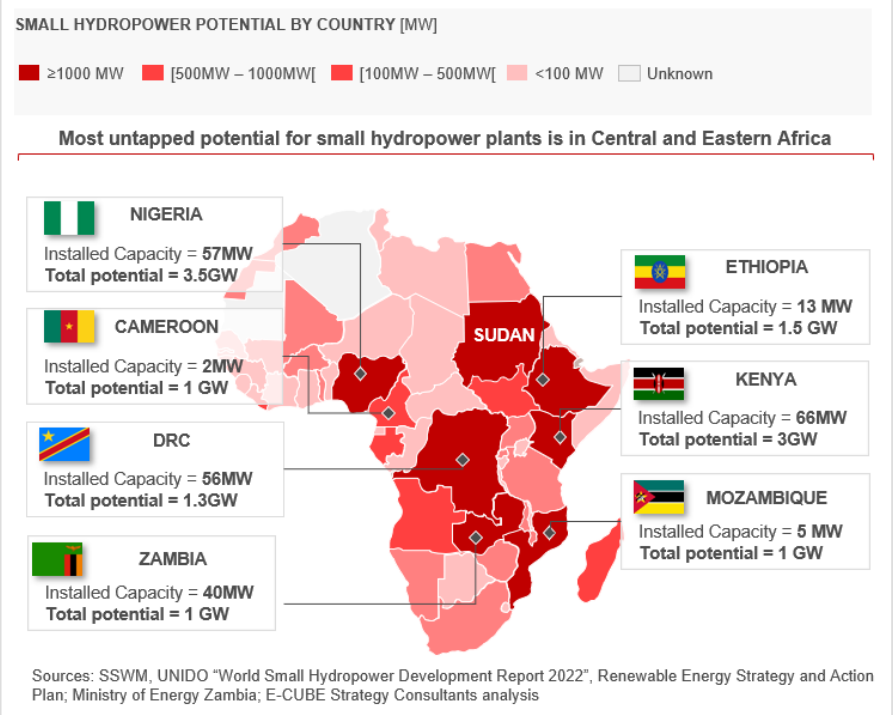

Figure 6: Small hydro technical potential by country in Africa.

2.2.2 Solar PV: an almost unlimited potential spread across the entire continent.

The solar potential in Africa is virtually unlimited and evenly distributed across the continent. Solar radiation averages **2,120 kWh/m².** For comparison, solar radiation averages 1,450 kWh/m² in France and 1,800 kWh/m² in Spain.

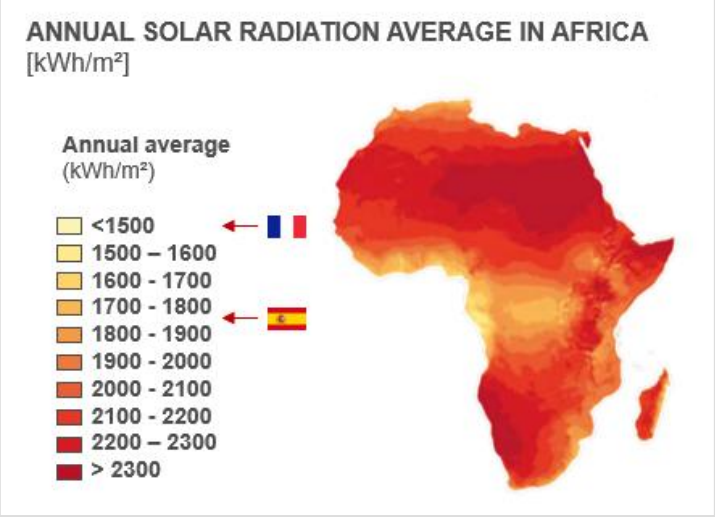

Figure 7: Annual solar radiation average in Africa[5].

These exceptional solar radiation conditions provide Africa with a technical solar PV power production potential of 7,900 GW. However, only 15 GW have been installed to date, representing **less than 0.2% of the total potential.** For comparison, **the total** solar PV capacity developed in Africa is less than the capacity added by Germany in the single year of 2024 (16 GW).

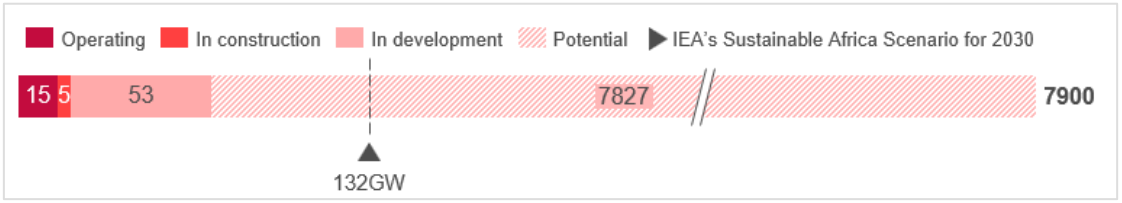

Figure 8: Solar PV capacity and technical potential in Africa [GW, 2023][6].

2.2.3 Onshore wind: a significant, yet more regionally concentrated, potential.

Onshore wind resources in Africa are more localized. While the continent's median wind speed is comparable to that of France, some countries do have exceptional wind conditions (e.g., exceeding those of the UK). These very high wind speeds are found in specific regions, including North Africa (Morocco & Mauritania), Eastern Africa (Somalia, Ethiopia, Kenya), and RSA.

[5] Global Solar Atlas (ESMAP, 2019b). The solar potential estimated by IRENA is calculated based on the average irradiation in kWh/m² per year and the area of the continent, assuming a land utilization of 1%.

[6] African Union Development Agency "Continental Power Systems Masterplan"; IEA's Sustainable Africa scenario.

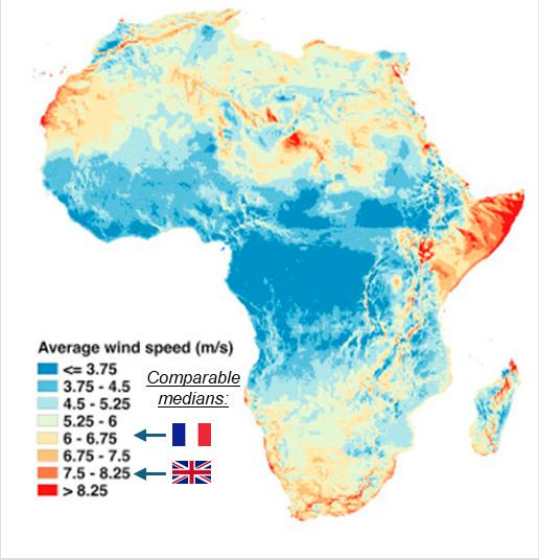

Figure 9: Annual wind speed average in Africa [m/s].

Africa's technical potential for wind power production is significant, estimated at **441 GW, and is** primarily concentrated in North Africa, South Africa, and Eastern Africa. However, only **9 GW** has been installed to date, almost entirely in North Africa and RSA. The current installed capacity represents just **3%** of the total potential.

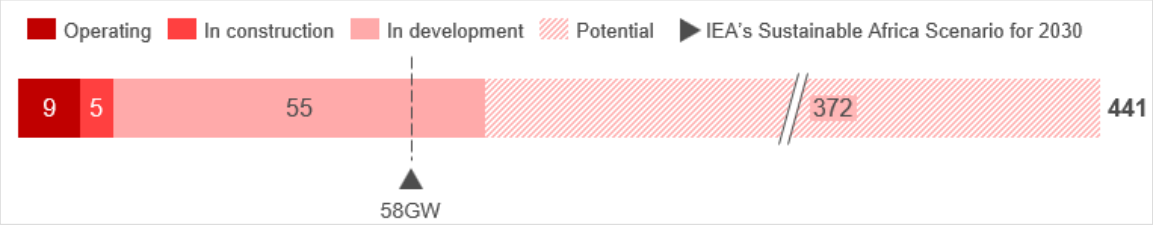

Figure 10: Onshore wind capacity and technical potential in Africa [GW, 2023][7]

[7]Technical potential estimated from wind speed data over the continent, considering techno-economical aspects (exclusion of military zones, areas too far from roads or grids...); Sources: IEA's Sustainable Africa scenario, IRENA.

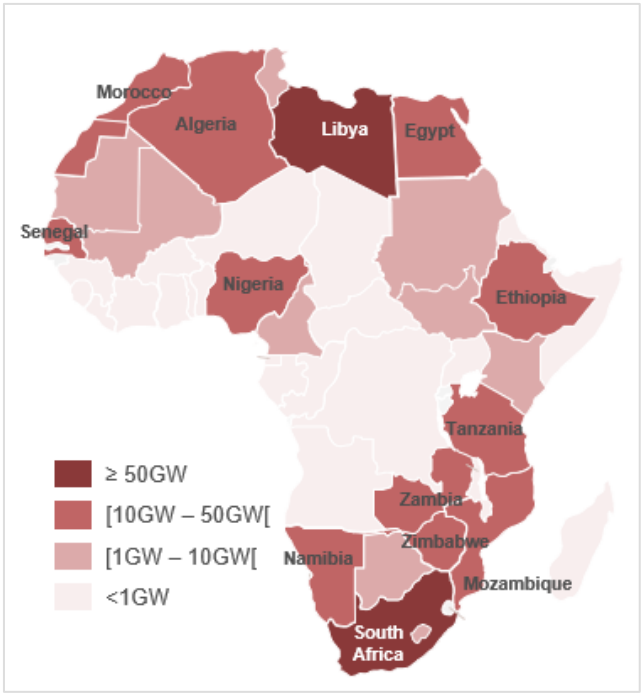

Figure 11: Onshore wind potential by country in Africa [GW][8].

2.2.4 Geothermal power: strong potential concentrated in a few regions

Geothermal energy is a promising resource in Africa, primarily concentrated in the volcanically active Great Rift Valley in the eastern part of the continent. The majority of this potential is located in just two countries: Ethiopia and Kenya.

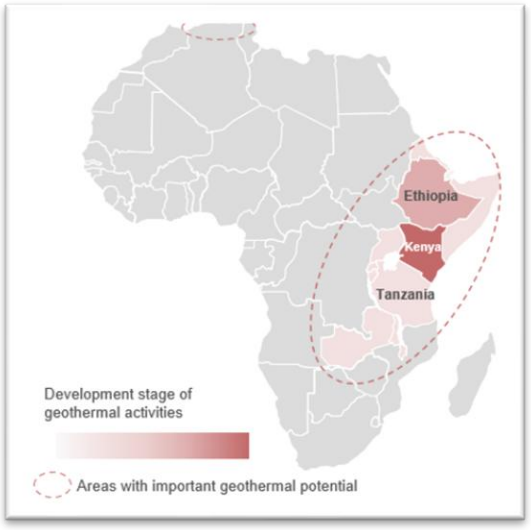

Figure 12: Development areas and regions with significant geothermal potential in Africa.

[8] Global Energy Monitor “Global wind power tracker”.

Geothermal energy development is significantly more complex than solar PV or wind technologies. It requires the drilling of geothermal wells to depths ranging from 1,000m to 4,000m. The development of these wells, from initial geological exploration to drilling, can take up to six years. Geothermal energy can then be utilised for either for either heat production or power production – the latter requiring an additional 1-2 years to develop the power plant.

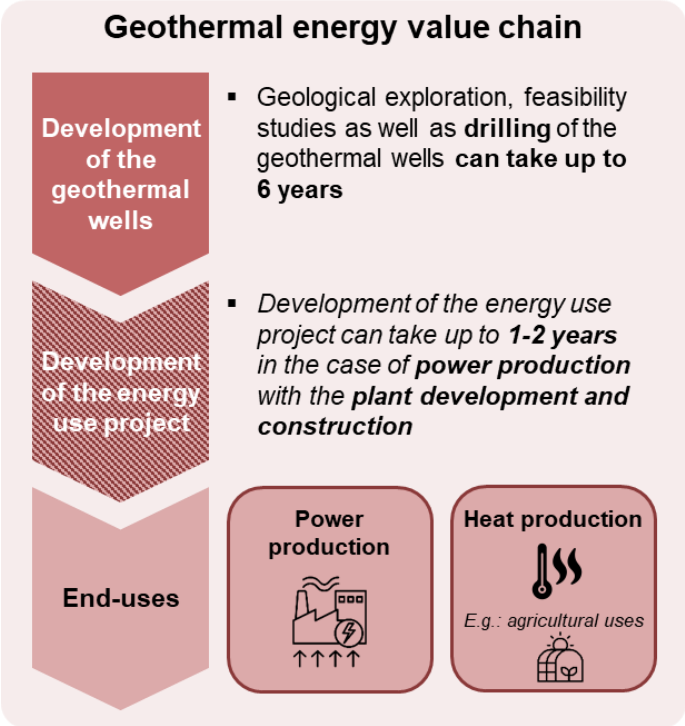

Figure 13: Simplified geothermal energy value chain.

Estimating geothermal capacity is complex due to the unpredictable nature of underground heat sources and the substantial costs associated with exploration and drilling. Studies estimate the power production potential of geothermal energy in Africa to be between **15 and 30 GW**. So far, power production is the only developed end-use, with the currently installed capacity – 1 GW – almost entirely located in Kenya.

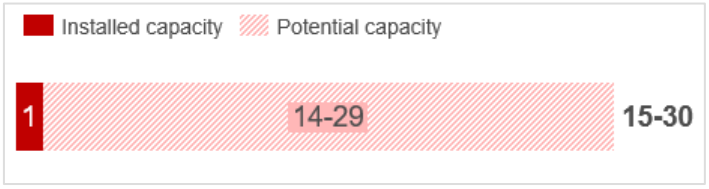

Figure 14: Geothermal energy development stages and potential [GW; 2022].

2.2.5 Biomass energy: a nascent market.

The biomass sector, while still nascent, is progressively developing. Local projects, spanning both C&I and on-grid applications collectively **represent approximately 1 GW** of installed capacity. These are primarily located mainly in Eastern and Southern Africa. Biomass energy C&I projects

aim to provide industrial consumers with a viable solution for decarbonization or reducing electricity costs.

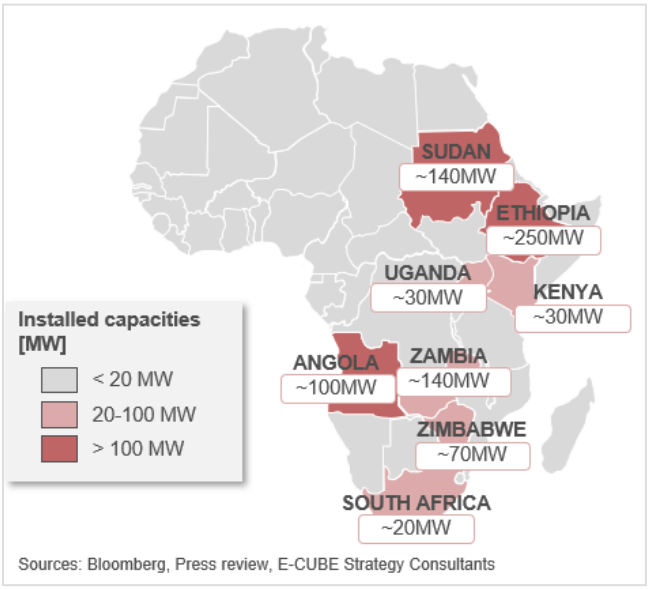

Figure 15: Biomass powerplants installed capacity [MW].

2.2.6 Storage: a promising opportunity yet to take-off.

Africa has a long **history of blackouts**, due to the low reliability of its grids. Recent examples of these recent power outages include **Senegal** in 2016, following an electrical installation explosion; in **RSA** since 2022, where loadshedding can last up to ten hours a day; and in **Nigeria**, which narrowly avoided a nationwide blackout in 2022.[9]

The growth of renewable energy in Africa will place additional strain on the grids due to the intermittent nature of wind or solar PV production. This will increase the need for **flexibility.** Gas-fired power plants, hydropower (including pumped storage), geothermal power plants, and batteries are expected to play key roles in addressing this challenge.

Uncertainty remains as to when the development of flexibility will take-off, particularly for battery storage[10] , which is still in the early stages. Most of the capacity is currently located in RSA, the continent's most advanced market, where 500 MWh have been installed so far[11].

First announcements have been made about PPAs signed with state utilities for collocated solar PV + Battery Energy Storage Systems (BESS). A recent PPA was signed in a West African country for a 100 MW + 180 MWh project.

Utilities have shown increasing interest in BESS, as these systems offer a wide range of services to the grid operator, such as frequency and voltage regulation, power smoothing, and load shifting. These systems have much faster and more reliable response times and have proven to

[9] Jeune Afrique; Benin TV.

[10] IEA expects battery storage deployment to remain modest until 2030 to reach 10-20 GW of installed capacity, then quickly accelerate thereafter.

[11] Climate Justice Central.

be more efficient than traditional solutions, as well as less expensive than using the spinning reserve provided by thermal power plants. They also facilitate easier integration into the grid by smoothing out intermittency phenomena and reducing connection cost.

> *"I truly believe that Solar PV & BESS collocation is the next move in Africa. When I look at my pipeline,* ***50% of the solar PV projects we are developing include battery storage****" - CEO of an IPP active in Africa.*

2.2.7 C&I: A catalyst for renewable power development in Africa?

Renewable energy investment in Africa focuses on three key segments: on-grid utility-scale power production, C&I, and solar home systems/mini-grids. These segments differ significantly in their approach, target customers/off-takers and skill sets required for succeed.

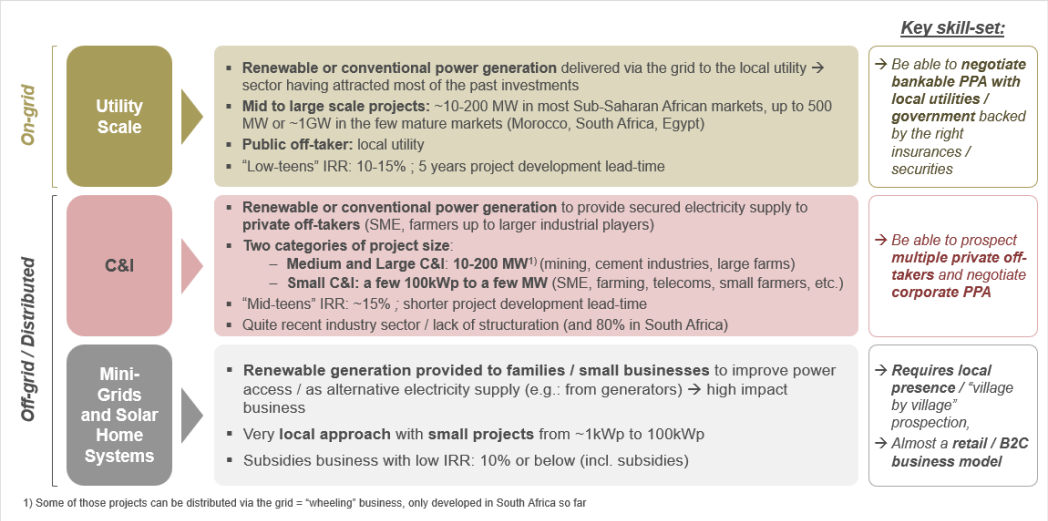

Figure 16: The three key segments targeted for renewable power production in Africa.

The utility-scale segment is the most advanced and has been the key driver of renewable power production development in Africa over the past decade.

Mini-grid and solar home systems are **high impact, low profitability** businesses. They require a strong local presence, such as village by village prospecting, and can almost be considered a retail or business-to-consumer (B2C) model. This segment has primarily been targeted by European utilities, familiar with the B2C model, and development finance institutions (DFIs), given the high impact nature of the projects.

The low reliability of African grids led many private players, from small and medium-sized enterprises (SMEs) and smallholder farmers to large commercial and industrial firms, to rely on diesel generators as back-up. Rising diesel cost, coupled with decreasing prices for solar PV modules, have recently driven an increase in sales of solar PV + battery systems to these private customers. **These systems are typically financed either through the customer's own balance sheet** or **via third-party ownership models supported by corporate power purchase agreements (PPAs)**. The latter business model is commonly referred to as the **renewable power C&I segment**.

The C&I business is still in its early stages and lacks significant structure[12]. Most of these projects have been carried out in RSA (over 80%), as well as in Egypt and Nigeria. However, recent announcements have shown that the **C&I projects pipeline** has expanded to at least **12 additional countries** since 2022. For example, Nigeria-based Starsight Energy merged with South Africa-based SolarAfrica in 2022 to create the largest pure-play C&I energy service provider on the continent. Another prominent South African C&I company, Solarise Africa, has been raising funds from various investors[13] to establish a leading pan-African C&I platform. The company has made acquisitions of smaller companies and project pipelines in Kenya, Rwanda, Uganda, and Zambia.

Decarbonation is an additional driver for the development of the C&I sector, particularly in carbon-intensive industries such as mining or cement. For instance, mining company Eramet recently financed a 10 MW + 11 MWh solar PV + BESS project in Senegal, developed by the South African branch of IPP Juwi Renewable. Eramet has highlighted the decarbonation impact of this project. In 2022, the East African renewable energy investment platform, Frontier Energy, signed a corporate PPA with Lafarge's subsidiary, Bamburi cement. The PPA covers a 20 MW solar power production plant in Kenya.

The C&I sector requires significantly faster response times **and shorter development lead times compared to utility-scale projects. As a result, d**evelopers targeting this segment are exploring new investment strategies. to address these challenges. One of the main constraints on development timelines is the due diligence process associated with securing debt financing from DFI. To overcome this, **developers** are **considering financing a portion of the projects entirely with equity, with the intention of** refinancing future project expansion through debt. This approach could allow for an **early market presence** in this emerging sector. Additionally, similar strategies could potentially be applied to utility-scale projects, such as through smaller initial phases.

[12] As per interviews of local investors and developers.

[13] $8.9M of capital from Mergence Investment Managers in 2024; $33M of debt issuance in 2022 from Facilité pour l'Inclusion Énergétique (FIE), Oikocredit et AfricaGoGreen Fund; $10M from Energy access venture, Proparco and Electrification Financing Initiative.

3 Africa presents a high-risk and complex investment landscape.

3.1 Country-level drivers of market complexity and risk

Political risks

Africa is often considered one of the least politically stable regions in the world. The continent consistently ranks among the lowest on the Global Peace Index[14], and frequently experiences political turmoil. Ongoing conflicts have been observed in countries such as Libya, Sudan, South Sudan, and Democratic Republic of Congo. In addition, recent military coups in Gabon and across most of the Sahel region (including Mali, Niger, Chad, and Burkina Faso) have further contributed to instability. Even traditionally stable nations have faced political unrests, such as the recent crisis in Senegal triggered by 2024 elections, which was fortunately avoided. This high level of political instability is accompanied by significant challenges in the ease of doing business. Africa has an average score of 51.8 on the index, considerably lower than [15].

Given these governance-related risks, foreign private investors often seek to secure projects through political risk insurance, such as the World Bank Group's Multilateral Investment Guarantee Agency[16]. However, investors frequently overlook the continent's diversity and tend to apply uniformly higher-risk ratings across all African countries – a phenomenon informally known as the "Africa premium"[17].

Macroeconomic environment

Africa's macroeconomic has deteriorated in recent years, worsened by Covid-19 and the surge in food and fuel prices following Russia's invasion of Ukraine. These crises have further increased debt burdens on the continent, coinciding with a decline in energy investment, over the past decade.

[14] An index created in 2007 by NGO Institute of Economics & Peace and measuring the level of peacefulness in 162 countries.

[15] As per World Bank 2020 Sub-Saharan Africa fact sheet report on ease of doing business.

[16] Those insurance can cover risks linked to breach of contract, expropriation, war, and civil disturbance, as well as transfer and convertibility risk linked to restrictive central bank or government decisions.

[17] As described in IEA's 2023 Financing Clean Energy in Africa and source from Fofack, 2021.

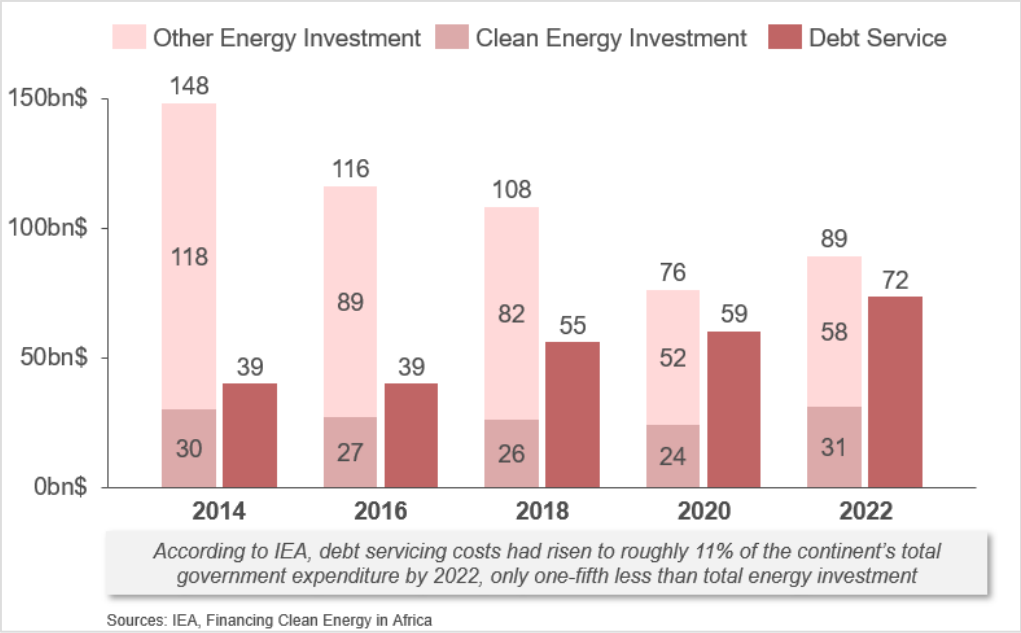

Figure 17: Debt servicing cost and energy investment[18].

Currency volatility

African markets have experienced significant currency volatility, and high inflation context, both of which have been exacerbated by recent global crises.

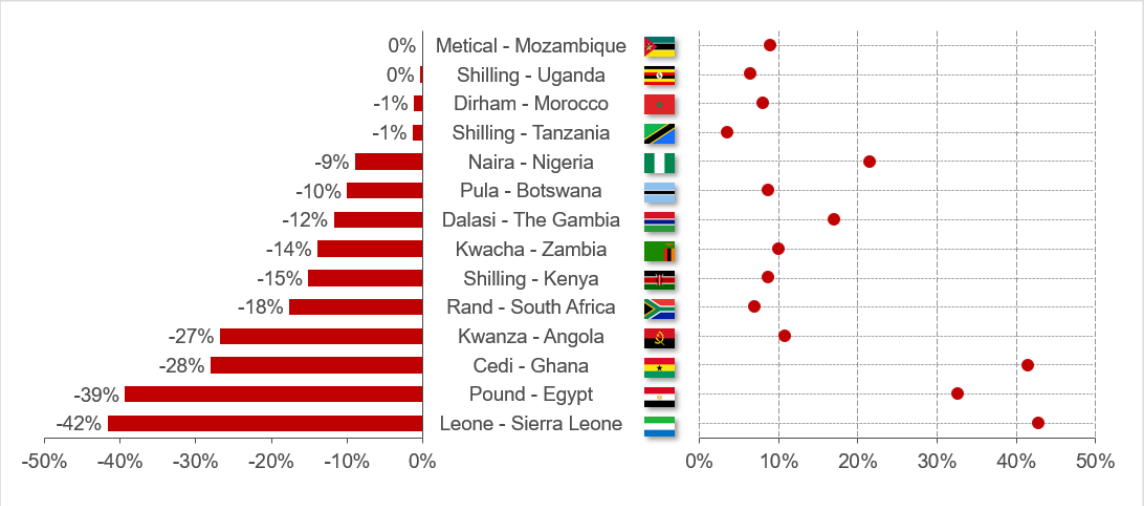

Figure 18: National currency exchange rate per USD and inflation over 2022-2023[19].

These factors, coupled with the limited depth of local capital markets, have led the majority of investments across the continent, except for RSA[20], to be conducted in foreign currency. This is

[18] IEA, Financing Clean Energy in Africa.

[19] IEA, Financing Clean Energy in Africa, 2023.

[20] South Africa has deep capital markets.

evident in international investors' preference for PPAs denominated in foreign currencies such as EUR or USD, or in currencies pegged to foreign benchmarks like XOF, XAF. As a result, currency risk is often transferred to utility and, in some cases, end users.

3.2 Combined with sector-level drivers

Regulatory environment and reliability of offtake

The development of regulatory frameworks for clean energy varies significantly across Africa. A few countries, such as Egypt, Morocco and RSA, are considered mature markets for private investments in clean energy. These nations have established advanced regulatory frameworks and structured tendering processes, which have contributed to their position as key investment destinations over the past two decades.

Sub-Saharan Africa, excluding RSA, remains significantly less developed in terms of clean energy regulation. Most private investments in the on-grid segment rely on direct negotiations with governments and local utilities rather than structured frameworks. Countries like Uganda, Senegal, Ghana, and Kenya have more developed environments, with utilities that generally adhere to guidelines[21]. However, in most other nations, privately-owned clean energy assets are almost non-existent. The absence of regulatory framework must be addressed during project development through engagement with and education of local governments and utilities to help structure bankable PPA.

The off-taker's ability to meet payment obligations is a is a key factor in power projects investments, providing capital providers of timely and full payments. In Africa, most utility-scale projects supply electricity to state-owned utilities. While 30 countries allow private sector participation in power generation, only four permit private involvement in transmission[22]. Additionally, many African utilities face significant financial difficulties, affecting both their short-term cash flow and long-term financial stability. As a result, investors often seek government-backed guarantees on PPA to mitigate financial risk.

[21] As described in IEA's 2023 Financing Clean Energy in Africa and according to the AfDB's Electricity Regulatory Index (AfDB, 2022).

[22] As described in IEA's 2023 Financing Clean Energy in Africa.

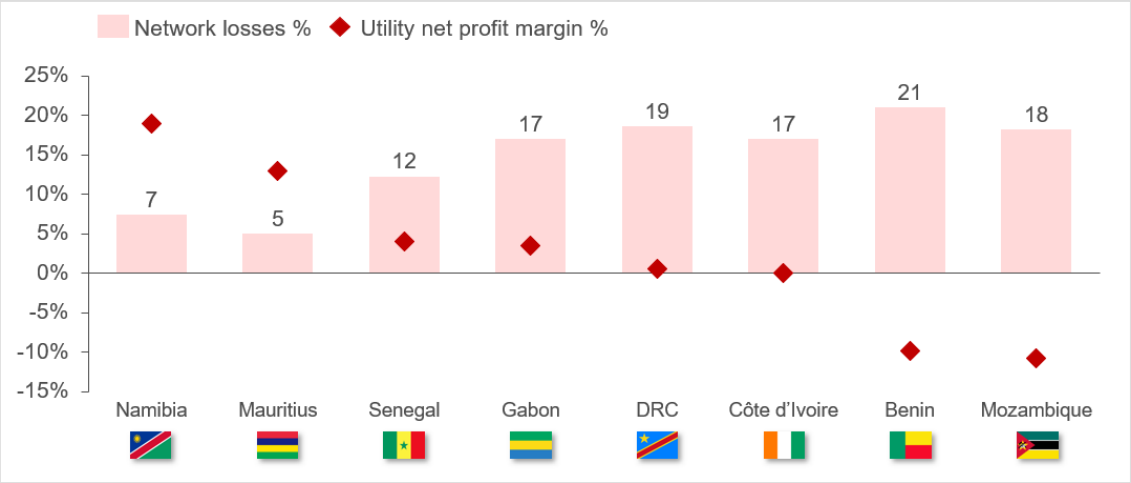

Figure 19: Share of network losses and net profit margin of state-owned electric utilities in selected African countries, 2020[23].

The increasing level of indebtedness in African countries has hardened the conditions under which governments grant such guarantees (e.g., indexing the PPA on foreign currency rather than local currency). These guarantees could negatively impact their ability to negotiate with international creditors such as the IMF. For example, Kenya issued a moratorium on PPA in 2021 to alleviate the cost borne by the heavily indebted Kenya Power.

Grid constraints

Grids are the problem child of Africa's energy sector. They face significant reliability issues, resulting in frequent outage and load shedding. Grid development and reinforcement are often prerequisites for large power production projects. For example, large hydropower projects like Rufiji Hydropower Project in Tanzania (2.1 GW) raised concerns about grid capacity, which in turn slowed down the development of other renewable projects by delaying grid connection requests in the area.

3.3 Result in higher cost-of-capital, shrinking returns and long development lead times.

The perceived risk of investing in the energy sector in Africa is reflected in a significantly higher costof capital compared to advanced economies, with costs almost twice as high for Solar PV or battery storage.

[23] IEA, Financing Clean Energy in Africa, 2023.

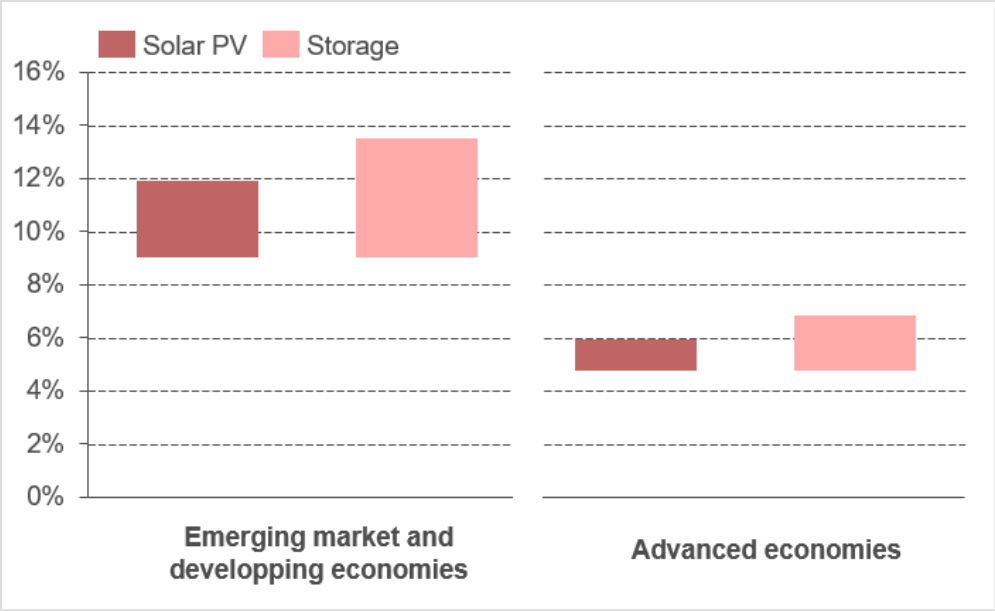

Figure 20: Cost of capital ranges for solar PV and storage projects that reached a final investment decision in 2022[24].

At the same time, local macro-economic conditions, combined with global inflation and rising interest rates, have pressured projects returns. It is also becomes increasingly challenging for project financed by international investors and paid in local currency to retrieve returns in the investors' own currencies.

[24] IEA, Financing Clean Energy in Africa, 2023.

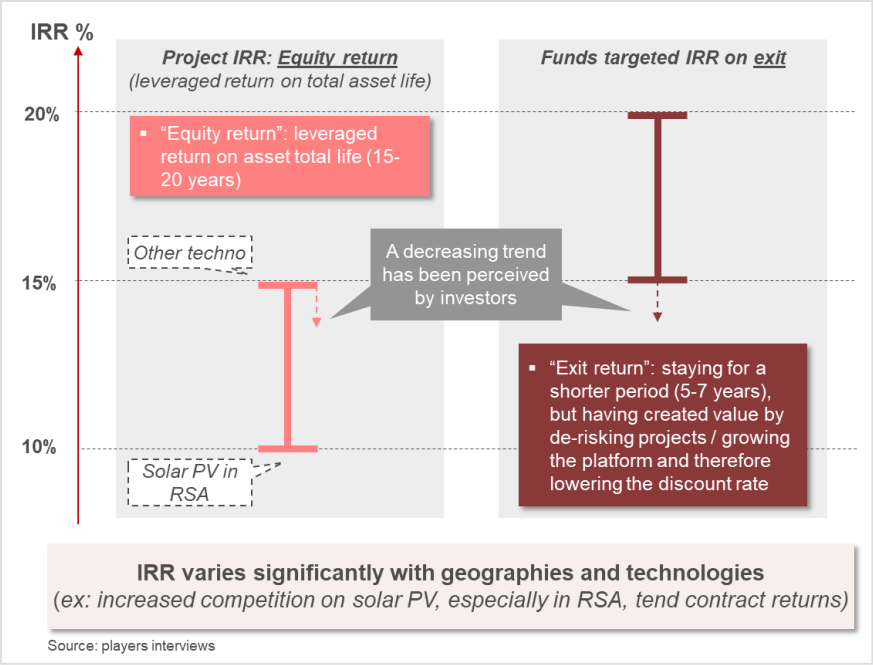

Figure 21: Project IRR (equity returns) and target IRR (on exit) for energy investments in Africa.

As a result of the multiple layers of complexity, project development lead times in Africa can be significantly longer than in advanced markets. The development of a power production project (Solar PV or Wind) typically takes a minimum of five years from early stages to commissioning. Frequent delays arise due to various constraints and uncertainties inherent to African markets. Iconic clean energy projects such as Lake Turkana in Kenya, took more than 10 years to develop.

4 Investments in Africa's energy sector have slowed over the past decade as key players have lost enthusiasm.

Africa was considered a highly promising market in the early 2000s, attracting numerous international investors. However, energy investment has declined sharply since the mid-2010s, despite a recent post-Covid rebound driven by clean energy.

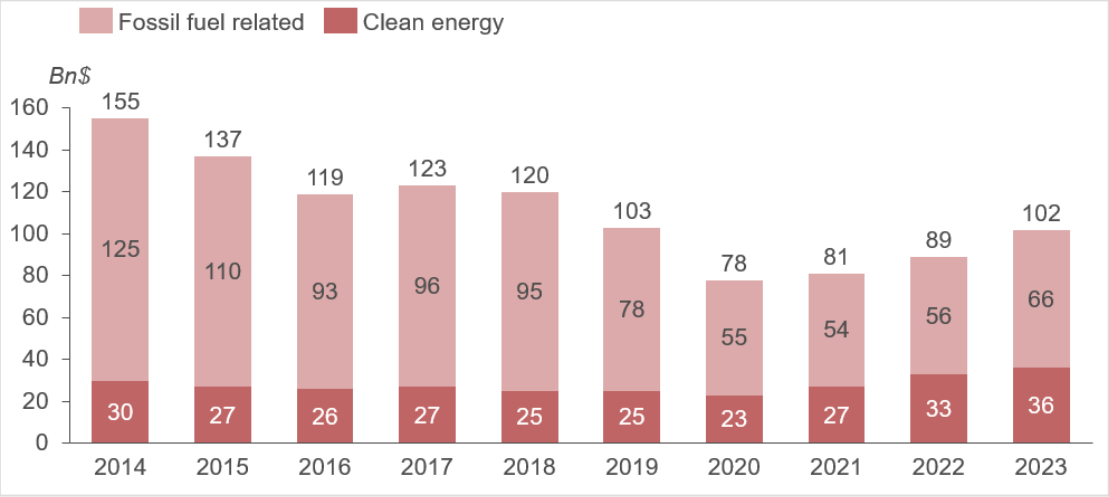

Figure 22: Energy Investment in Africa by type, 2014-2023[25].

4.1 The renewable power investment ecosystem in Africa is dominated by DFIs, regional Infra/PE funds and regional platforms.

The main providers of private funding (equity and debt) in the energy investment ecosystems are development finance institutions (DFIs), infrastructure/private Equity funds, international industrial players, and regional platforms.

[25] IEA, Financing Clean Energy in Africa, 2023.

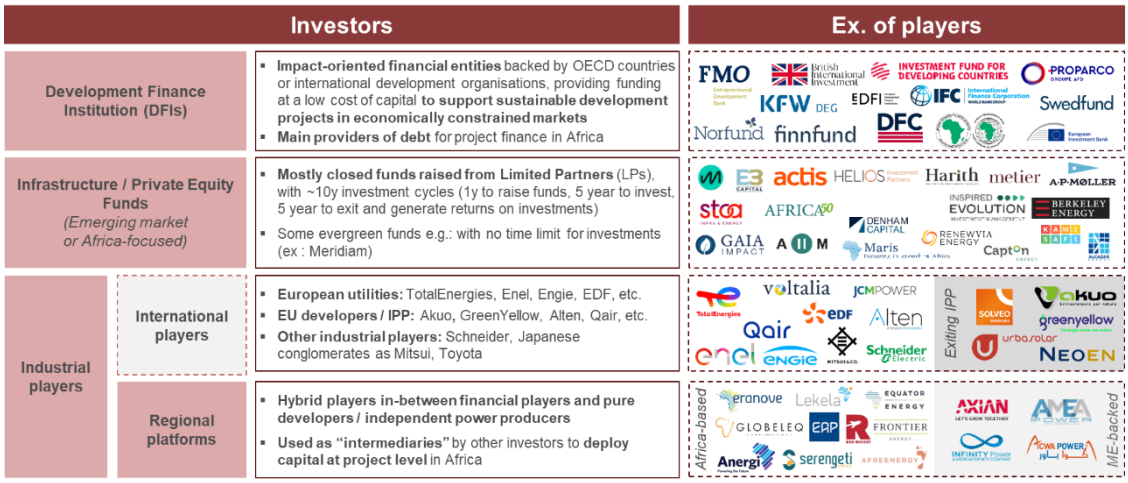

Figure 23: Africa's energy investment ecosystem.

Development Finance Institutions: the (sole) providers of debt for project finance.

Development Finance Institutions (DFIs) *are financial institutions that provide debt and risk capital for economic development projects on a non-commercial basis. They are established and backed by governments (typically of OECD countries but also from China), international nonprofit organizations such as the World Bank, or regional development banks. Their primary goal is to* ***foster development*** *by* ***offering long-term debt and equity financing*** *for projects that generate significant economic, social, and environmental benefits. DFIs primarily target regions where private capital is scarce due to perceived* ***risks****.*

In Africa, DFIs play a crucial role in driving clean energy development and have provided a steady flow of funding over the past decade *(USD 10-12 billion a year).* ***DFIs step in to fill financing gaps*** *where traditional commercial banks are either absent or reluctant to engage****, making them the quasi-sole providers of debt for project finance****.*

DFIs provide financing ***both at platform and project level*** *(see figure 27). Moreover, DFIs also invest as limited partners (LPs) in* ***Infrastructure/PE funds*** *to access a pipeline of investment opportunities and co-invest in platforms and projects. This strategy followed by BII (UK), Norfund (Norway) or Finnfund (Finland).*

DFIs are committed to the market for the long-term *and have no planned exit strategies.*

The institutional nature of DFIs is associated with ***lengthy processes****, including* ***thorough due diligence*** *for debt or capital allocation. This is one of the factors contributing to extended project development lead-times in Africa.*

Finally, ***DFIs have*** *pledged* ***to reduce their financing to fossil fuels*** *(particularly coal and oil) in favour of clean energy investments. While this shift is not yet reflected in recent consolidated figures (e.g., in 2023), the shared perception among African investors is that securing financing for finance fossil fuel-fired projects, including gas, is becoming increasingly difficult.*

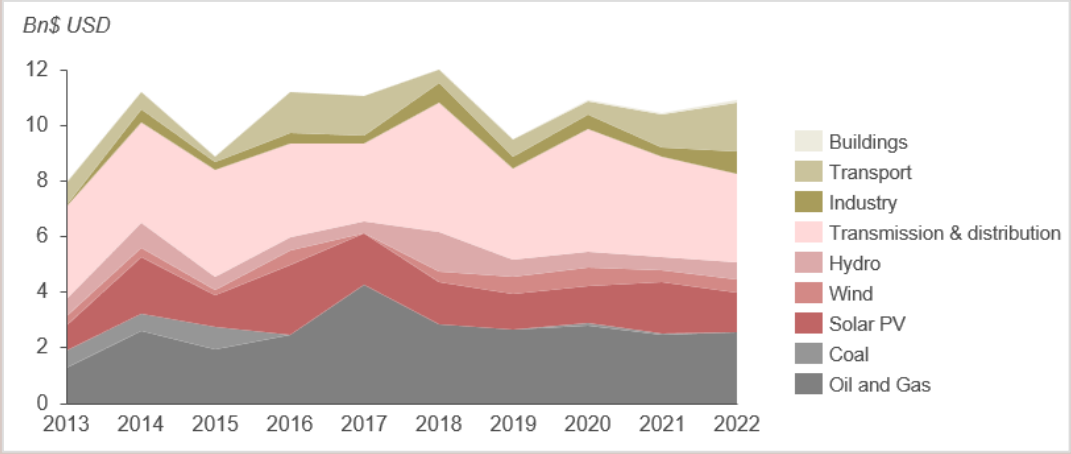

Figure 24: Development finance institution energy spending in Africa by source and sector2013-2022 - World (excluding China)[26].

Infra/PE funds: investment based on cycles.

Most infrastructure and PE funds investing in Africa's energy sector are closed-end funds operating on an approximate10-12-year cycle:

- **Fund raising period**: Typically lasts 1-2 years, during which capital is raised from limited partners (LPs)[27].
- **Investment period**: Spans around5 years, focusing on deploying capital by investing at the platforms or project level.
- **Exit period**: Lasts around5 years, during which the fund exits its various investments to generate returns for its LPs.

Figure 25: PE Funds investment cycle.

Fund managers active in energy in Africa (e.g., Actis, AP Moller, AIIM, Inspired Evolution) have been launching new closed funds approximately every five years. While they **have remained committed to the market**, the sizes of these successive funds have remained relatively constant. AP Moller or Actis have only been able to maintain or increase the size of their latest funds by

[26] Source: IEA, Financing Clean Energy in Africa, 2023.

[27] Limited Partners (LPs) in Africa's projects include family offices, pension funds from OECD countries, international industrials, and sovereign wealth funds, particularly from the Middle East or Africa.

expanding into new emerging markets (such Latin America or Southeast Asia) or diversifying into sectors beyond energy (e.g., broader infrastructure). Some funds, classified as “evergreen,” invest with a long-term approach and no planned exit strategy. In Africa, Meridiam is one of the few active funds following this model.

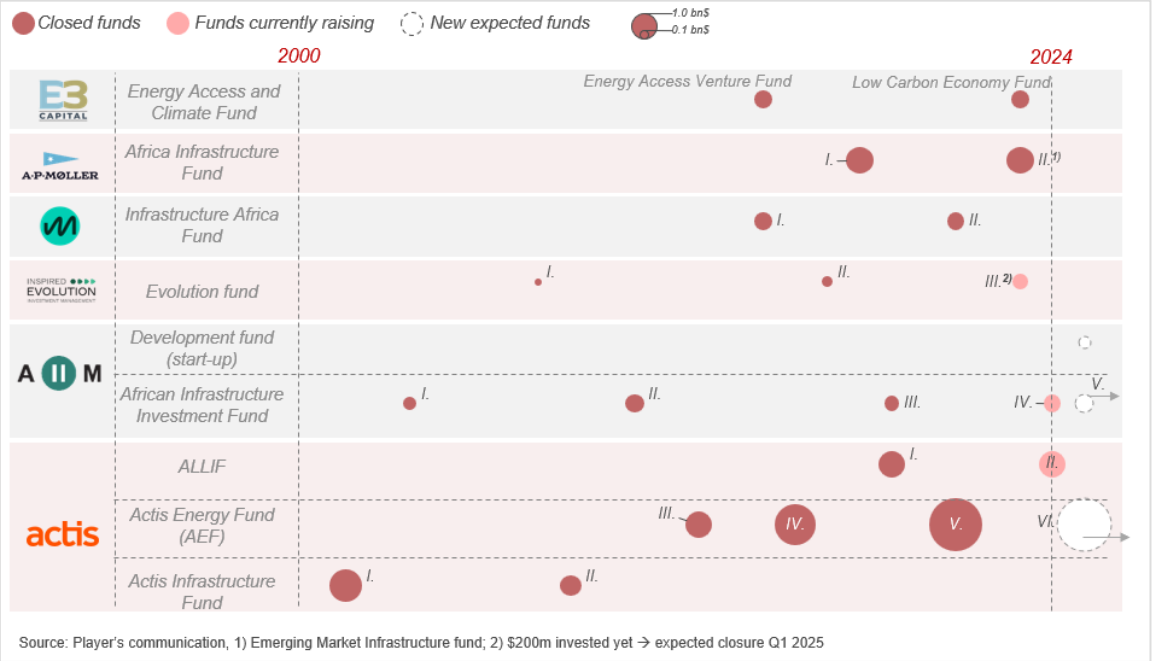

Figure 26: historical major fundraisings dedicated to financing Africa energy transition [$Bn, 2002-2024].

Regional platforms: “intermediary” players used to mitigate risk.

In Africa, power production project development lead times tend to exceed the investment cycles of PE funds. To mitigate this, as well as the inherent risk associated with the market, most funds have moved away from direct project-level investments. Instead, the trend is now to invest at the platform level. Platforms act as “intermediary” players, offering a diversified portfolio or pipeline - both in terms of development maturity, and geographical spread. Some early-stage platforms have also emerged at the national level, focusing on single-country markets.

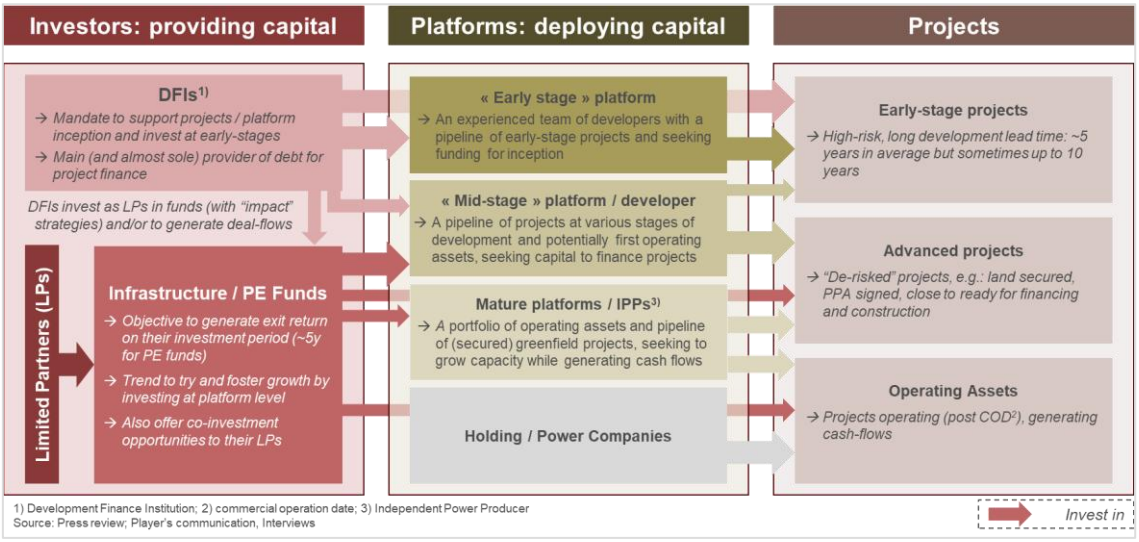

Figure 27: Nature of investors and investments in African renewable energy project.

4.2 Historical OECD-based investors in Sub Saharan Africa have been losing enthusiasm.

The international infrastructure and private equity funds, particularly those with a primary OECD footprint, have been gradually moving away from the continent. This shift stems from the struggles they faced while investing in Africa, where their involvement never evolved into a core focus but remained an opportunistic play. A notable example is the recent decision by French IPP Akuo to sell its Africa activities, which could be interpretated as pressure from its main investor – an OECD-based infrastructure fund – to re-focus the company's activities on its core markets.

Only a few **funds dedicated to investing in emerging and developing markets,** such as Actis, remain committed to the African market. However, even these funds have been broadening their scope, both geographically and across sectors, expanding into areas such as transport and communication.

European utilities have re-focused their investments on the few mature African markets: Egypt, Morocco, and RSA. For **example**, 95% of Engie's 1 GW clean energy portfolio is concentrated in in these **three** markets, **with** only 60 MW located in Senegal. The company's last **major** acquisition in Africa **was** BTE Renewable[28]RSA operations. Similarly, Enel Green Power's 2 GW of installed clean energy capacity in Africa is 99% located in Morocco and RSA, with **just** one 34 MWasset in Zambia. EDF Renewables' portfolio and pipeline **are** almost entirely in Egypt, Morocco, and RSA, where 1.2 GW is under construction.

TotalEnergies appears to take a more long-term approach, extending its focus to green hydrogen through TotalEren, which it fully acquired in 2023. The company has also recently expanded into

[28] Meridiam took over the Kenyan part of the portfolio.

solar home systems and mini grids, a $500m fund in collaboration with Shell, BP and Equinor, dedicated to this segment.

Most European IPPs, which initially entered the African market with a short-term vision to secure quick wins, are now seeking to withdraw and refocus on Europe. As a result, many have been attempting to sell their African portfolios, with recent transactions reflecting this trend. However, several have struggled to find buyers[29]. Only a handful of IPPs, such as Qair (France) or Alten (Spain), remain actively engaged in development on the continent.

Player	Transaction	Date
Akuo	Akuo sold its operations in Africa to Taranis Energy for Africa. The transaction included a 50 MW Solar PV asset in Mali, along with the development team dedicated to Africa.	Dec. 2024
Greenyellow	Afreenergy has acquired GreenYellow's solar assets in Senegal. Previously, GreenYellow sold its 30 MWp stake in Burkina Fasso, and its 40 MWp share in the Ambatolampy plant in Madagascar to Axian. GreenYellow now focuses on the energy transition solutions for businesses in France, South Africa and the Indian Ocean.	July 2024

"I made the choice to withdraw from Africa as I have only managed to develop in 10 years what I develop in 1 month in Europe" – CEO of a French IPP

These strategic refocuses can also be seen as a consequence of the rapid acceleration in renewable energy development across European countries. In 2024 alone, the EU added 65 GW of solar PV and 16 GW of wind capacity. This acceleration in their core markets provides ample opportunities for these players to expand and invest closer to home.

4.3 A few success stories in Sub Saharan Africa: players committed for the long run.

Success stories: a few regional platforms betting on the long term.

In Sub Saharan Africa (excluding RSA), only a few long-term players have emerged as significant contributors to the energy sector. The **top three pan-African platforms - Eranove, Globeleq, and Lekela -** stand out as success stories. Over the past decade, they have achieved **gigawatt-scale capacity**, reaching 1.6 GW, 1.5 GW, and 1 GW, respectively, in 2023. Their success highlights their ability to deliver large-scale energy projects across the continent. Although all three are shifting their focus towards renewables, their portfolios still largely **rely on gas, with** 60% of Globeleq's installed capacity and 80% for Eranove's.

A few additional platforms, particularly from Middle East, have begun to establish a presence in the market.

[29] Source: players interviews.

Masdar, the UAE state-owned RE company, announced a **10 GW** clean energy development plan for Sub Saharan Africa at COP28. **Masdar** also formed a joint venture with **Infinity,** Egypt's leading RE company, to establish **Infinity Power,** which completed the **acquisition of Lekela Power** in March 2023.

AMEA Power, a subsidiary of Al Nowais Investments – an Emirati conglomerate, entered the African market in 2016 and has since aggressively developed clean energy projects. By 2024, its portfolio has reached **1.2 GW of clean power production** in Africa[30]. The company aims to continue **its expansion and is currently seeking to** raise up to €300 million, targeting DFIs, institutional investors such as Softbank, and private investors.

Axian, backed by a Madagascan family, has also been among the most active investors recently[31], acquiring GreenYellow's assets in Madagascar and Burkina Faso. The company aims to reach **1 GW** installed capacity by 2030.

Some experts perceive these players as quite aggressive in terms of targeted IRR, likely due to their assumed lower cost of capital. However, E-CUBE's understanding is that their IRR targets are comparable to, yet at the lower end of, the typical range for investors in Africa (10-12%).

China's investment in Africa's energy sector largely focused on conventional power sources, with limited emphasis on renewables—except for large hydropower projects

*China's influence in Africa has expanded significantly since the early 2000s, **becoming the continent's largest trading partner in 2009 and the fourth-largest investor**. Between 2000 and 2018, China committed USD 148 billion in loans to Africa, with a quarter of this funding directed towards the energy sector.[32]*

***China investments in Africa are primarily channelled through its DFIs**. However, unlike the steady flow of funding from OECD-based DFIs, Chinese investments have been characterised by **large, targeted injections in specific years**. The peak was reached in 2016, with nearly USD 14 billion committed, but investment has sharply decreased since then, particularly following COVID-19 crisis, remaining below **USD 2 billion** per year over the past four years. In September 2024, China **pledged USD 50 billion in investments for Africa** over the next three years, ahead of the upcoming Forum on China-Africa Cooperation[33].*

*Moreover, over the past decade, Chinese DFIs have **almost exclusively focused on fossil fuels** (coal, oil, and gas), **transmission and distribution,** and **large hydropower** (e.g., the Gran dam Inga Dam of DRC).*

[30] 6 GW including Middle East and Central and South-East Asia.

[31] Source : players interviews.

[32] IEA.

[33] Le Monde, September 2024.

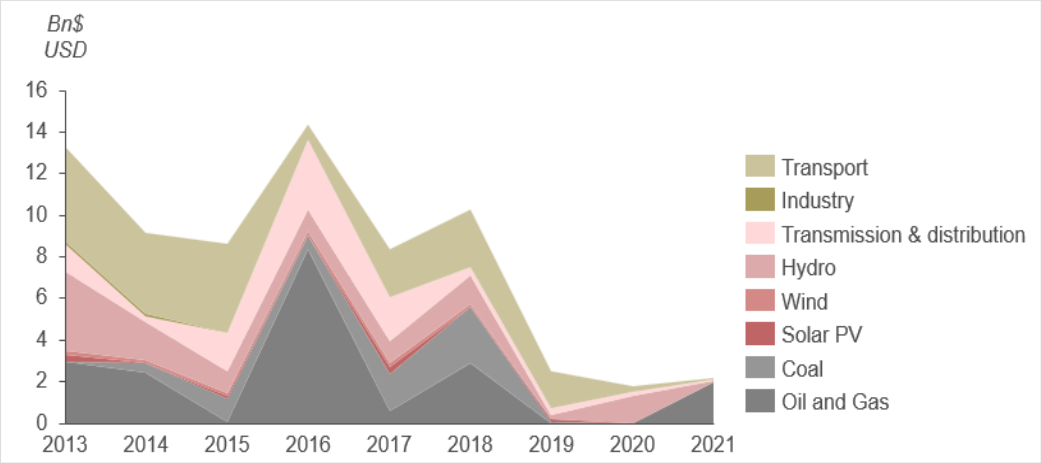

Figure 28: Development finance institution spending on energy by source and sector in Africa 2013-2021 in China[34].

*In 2021, China announced a shift in focus towards **private investment** in **renewable energy. However**, no significant moves by **Chinese IPPs** or **private investors have been identified** in **renewable energy projects outside of large hydropower – except for a few examples, such as a**100 MWp solar plant in Safo, Mali, and wind energy projects in Tanzania.*

*China still plays a key role in Africa's renewable energy transition due to its dominance in green energy **components**[35]. In 2023, South Africa alone imported 3.4 GW of solar panels from China.*

[34] Source: IEA, Financing Clean Energy in Africa, 2023.

[35] Ecofin Agency.

5 Conclusion: while huge investments are expected on the mid-term in Sub Saharan Africa, there is a window for a early mover with a long-term vision.

5.1 Investment needs and forecasts for the next decade are huge, particularly in independent clean power production.

Africa offers both significant potential for clean energy and a substantial need for investment to achieve universal electricity access. Experts generally agree that these investments are expected to take-off within the next decade.

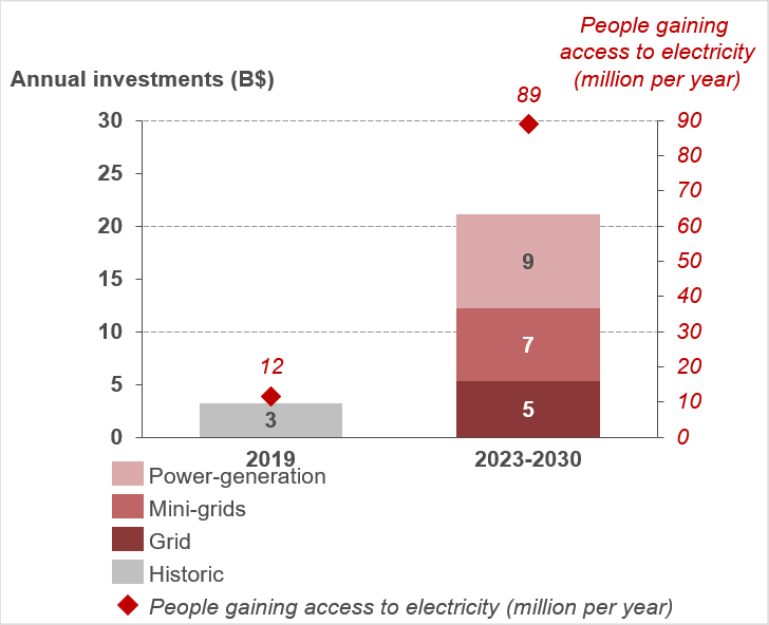

Figure 29: Annual investment in electricity access in Africa, and the number of people gaining access to electricity per year, for the years 2019 and the period2023-2030[36].

A significant portion of the forecasted investments is expected to come from **private sources,while DFIs** are likely to continue playing a central role in clean energy investments.

[36]As per IEA's Sustainable Africa Scenario.

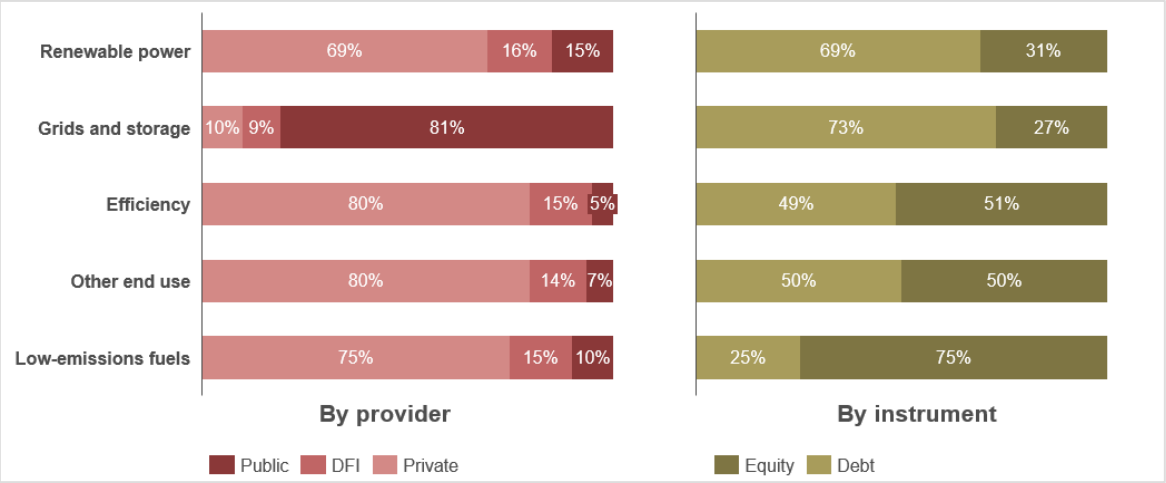

Figure 30: Sources of finance for clean energy investments in Africa by sector, provider, and instrument under the Sustainable Africa Scenario 2030[37].

5.2 There is a short-term opportunity for 'early positioning' with a long-term vision.

The disengagement of OECD-based players creates both a void to fill and opportunities for strategic positioning.

The withdrawal of OECD-based players from Sub Saharan Africa has resulted in a financing gap, but also opportunities for targeted acquisitions of operating assets and/or advanced pipelines (e.g., projects with signed or near-signed PPAs). Such acquisitions provide a way to establish a foothold in new countries, while securing the necessary resources and networks for further development in these markets. As most Sub-Saharan countries are in the early stages of development, the success of a single project can help establish a position as a reference energy producer, both with local government and utilities. This position can than serve as leverage for further long-term development.

"The acquisition of Akuo's Africa branch is a strategic move to fast-forward the development our Energy for Africa fund. It is a step forward in our mission to position as a clean and affordable energy producer across the continent, and for the long term." – Taranis

Closed funds also cyclical acquisition opportunities as they reach their exist phase. Due to the current investment slowdown, many of these funds, which invested during more optimistic periods, are now facing difficulties in exiting their investments. As a result, **Africa is currently a buyer's market**.

[37] IEA, Financing Clean Energy in Africa, 2023.

Fund manager	Fund in exit phase	Fund raised in	Capital invested (€M)
INSPIRED EVOLUTION INVESTMENT MANAGEMENT	Inspired Evolution II	2017	200
AIIM AFRICAN INFRASTRUCTURE INVESTMENT MANAGERS	African Infrastructure Investment Fund III	2019	400
actis	Actis Energy Fund (AEF) V	2021	4,600[38]
	Infrastructure Africa Fund II	2021	500
A·P·MØLLER	Africa Infrastructure Fund I	2018	1,200[39]

*"**The African continent in general is suffering from a lack of exit opportunities**" – Investment manager of a DFI.*

*"Africa is currently a buyer's market. **Most funds are struggling with exits**" – Local Investment Bank manager.*

"Exits are difficult right now; some funds struggle to exit" – Investment manager of a DFI.

Active local and regional developers are still seeking capital.

A **number of local developers have established early-stage or mid-stage platforms**, typically with a sub-regional focus (e.g., Western Africa or Eastern Africa) and specialising in one or more technologies (e.g., solar PV, wind, small hydropower, geothermal energy). They have built a pipeline of projects at various stages of development, diversified across countries, with some already operating assets generating cash flows. **Many of these players are currently seeking capital to finance their growth and project development**.

[38] Investing in Africa, Southeast Asia, and Latin America.

[39] 50% Africa – 50% South-East Asia. Fund covers energy – with investments in gas assets (Eranove), as well as other infrastructure such as port logistic or digital.

Developer	Regional footprint	Technologies	Size of pipe / portfolio (MW)
AFREENERGY	Easten and Western Africa		0.3 MW in operation 330 MW in development
EAP	Eastern Africa		14 MW in operation 900MW in development
AfricaRen	Western Africa		80MW in operation 250MW in development
serengeti energy	Southern and Eastern Africa		70MW in operation 300 MW in development
JCMPOWER	Southern and Eastern Africa (& Asia)		0.2 GW in operation 1GW in development
EQUATOR ENERGY	Eastern Africa		60MW in operation
FRONTIER ENERGY	Eastern Africa		100MW in operation 600 MW in development

Moreover, most of those platforms were initially backed by closed funds with a planned exit date. As a result, they must **raise funds, including for their operational assets,** or risk being split and sold off in parts when the initial investors exit after approximately 5 years. Some of these platforms are currently seeking are looking for investors to position rather as shareholders, creating **an opportunity for investors without an exit timeline**.

"I am currently raising my fund III. I have managed that the investors from the fund II accept the transfer of my pipeline and portfolio from the fund I, and I am confident that the investors from the fund III would accept as well. That being said, I would rather have fewer investors ready to accompany me on the longer term given the development lead time in Africa is longer than most closed funds duration…" – East African platform CEO

DFIs commitment to renewable energy could trigger investment take-off.

DFIs **commitment** to **shift their investments** from fossil fuel to **clean energy** is expected to materialize, leading to a surge in financing opportunities. This should create an **afflux of financing opportunities,** capital but also and especially debt, **toward renewable energy**. This effect could be reinforced as DFIs commitments also influence PE and infrastructure funds active in Africa, given that many of these funds have one or several DFIs as LPs.

Sub Saharan Africa remains dynamic in clean power development.

A number of countries have shown recent demonstrated dynamism in developing independent utility-scale power production. This is reflected in various ways, such as the publication of clean energy development plans, the introduction of favourable regulations, the renewed interest of utilities in PPAs, and, of course, strong technical potential.

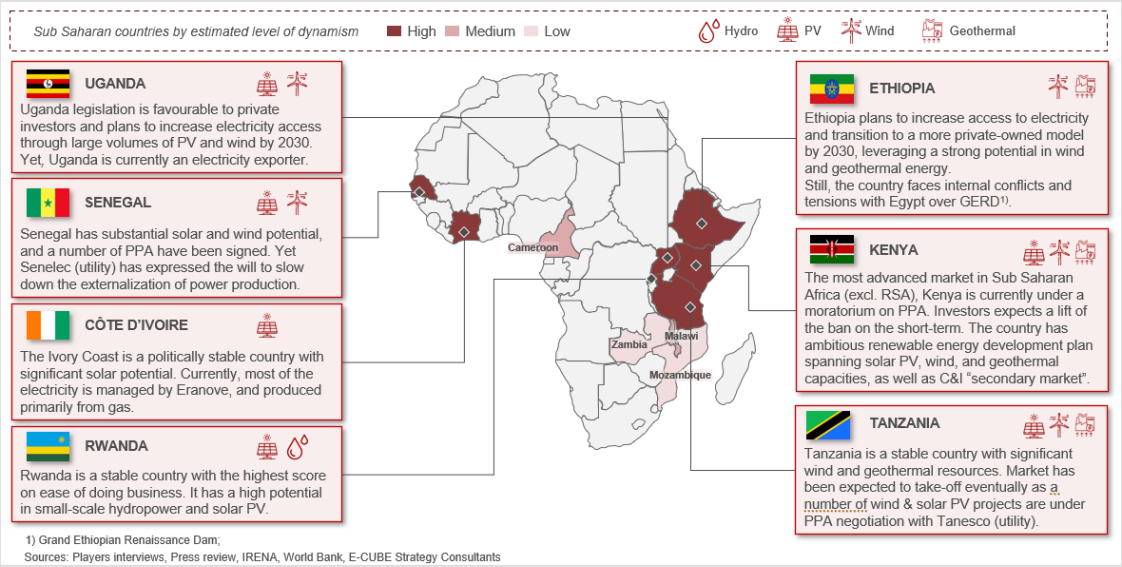

Figure 31: Dynamism of renewable energy development in Sub-Saharan Africa.

E-CUBE Strategy Consultants identifies a real window for an opportunistic short-term play in Africa's renewable energy sector. A daring financial investor could **secure an early positioning with a long-term vision.**

The market currently faces a combination of limited available financing, reduced competition, and a significant number of acquisition opportunities. This creates **a strategic moment for early mover to establish themselves in key Sub-Saharan markets**. By doing so, an investor could **become a reference player** for the local stakeholders while developing the networks and expertise needed for **long –term positioning**.

Such an early move could **secure a strategic foothold in the Africa's renewable energy investment ecosystem for the long run. This would provide a front-row seat as several market subsegments, including** solar PV, wind, small hydro, battery storage, and C&I, are expected to take off in the coming decade.

E-CUBE Strategy Consultants has developed deep expertise in Africa's energy investment landscape, fostering relationships with key industry players. Notably, E-CUBE supported Taranis, Perenco's investment arm, investment fund dedicated to energy in Africa. We also guided Taranis through its first transaction: the acquisition of the African team and portfolio of French IPP Akuo.

6 Glossary

B2C: Business-to-consumer

C&I: Commercial & Industrial

DFI: Development Finance Institution

DRC: Democratic Republic of Congo

IPP: Independent Power Producer

IEA: International Energy Agency

IRENA: International Renewable Energy Agency

IRR: Internal Rate of Return

LP: Limited Partner

PE: Private Equity

PV: Photovoltaic

PPA: Power Purchase Agreement

RE: Renewable Energy

RSA: Republic of South Africa

SAS: Sustainable Africa Scenario (IEA)

SME: Small and Medium Enterprise

XAF: Central African CFA franc

XOF: West African CFA franc