DATA GOVERNANCE IN AFRICA

THE STATE OF AFRICAN DIGITAL INFRASTRUCTURE

A XALAM MARKET BRIEF

PREPARED FOR HAUS, GIZ AND DIGITAL INVESTMENT FACILITY PARTNERS

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INTRODUCTION

- This report is part of a series of market briefs developed by Xalam Analytics at the behest of Digital Investment Facility (DIF) under the Data Governance in Africa Initiative, on the data center market opportunity in sub-Saharan Africa ("SSA").

- This analysis aims to provide key insights into market demand and supply patterns for data center markets, business landscape, regulatory impact and investment returns. The research aims to provide potential investors and stakeholders with the latest information on the data center market in the SSA region.

- This review is based on our assessment of information and data as available to our research. It is further underpinned by our understanding of the marketplace along with market data and insights collected through continuous research.

- This report focuses on the state of the broader African digital infrastructure market and the place of data centers within it. Regional and country-level summary insights are available separately from the Digital Investment Facility team.

- The numbers and estimates in this report are derived from a mix of sources, including estimates from Xalam Analytics' economic models, data providers, regulator data and other sources as may be indicated.

- This report is prepared with funds from the Data Governance in Africa Initiative, a project financed by the European Union, Germany, Belgium, Estonia, Finland and France under the Digital for Development (D4D) Hub. The contents of this Market Brief are the sole responsibility of Xalam Analytics and do not necessarily reflect the views of the funders.

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XALAM FRONTIER MARKETS

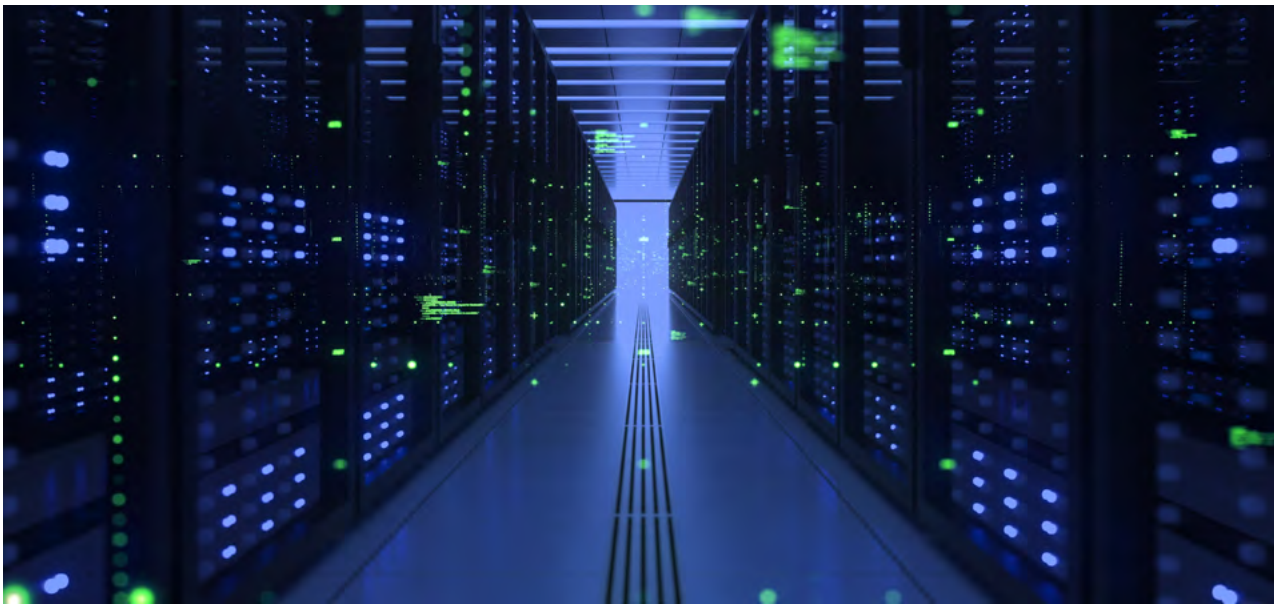
KEY DEFINITIONS

Data center	While there are a variety of definitions for data centers, this market review is focused on commercial facilities, that is, facilities that lease colocation white space and power capacity to third-party customers on open, commercial terms, and in exchange for a fee. Captive facilities (bank data centers, telco switch sites and similar) are excluded from this assessment. Estimates focus on facilities at Tier II standard and above, unless otherwise indicated. Where applicable, these estimates include cloud hyperscaler self-built facilities.
Live critical IT load	Capacity that is active, under lease or readily available for lease.
Full build capacity	Data center facilities are typically built in phases; the full-build capacity is capacity assuming all potential phases of build have been completed and are live.
Capacity in construction	Facilities that have broken ground; ongoing civil works, installation and commissioning phases.
Pipeline	Facilities publicly announced or listed as in development. Some execution phases have been initiated (e.g. land control, energy supply commitments, etc.), but no actual civil works have been undertaken.
Carrier-neutral	Facilities not specifically affiliated to a connectivity or cloud vendor, with capacity available to all third-party customers, on equal commercial terms, without explicit or implicit constraints or favoritism. This market review uses a loose definition for carrier-neutral, referring to facilities that are purely carrier-neutral, recognized by the market or effectively managed as such.

GLOSSARY

AI	Artificial Intelligence
ASN	Autonomous System Number
BB	Broadband
CAGR	Compound Annual Growth Rate
CapEx	Capital Expenditures
CDN	Content Delivery Network
Colo	Colocation
DC	Data Center
DFI	Development Finance Institutions
DIF	Digital Investment Facility
DRC	Democratic Republic of Congo
EU	European Union
FBB	Fixed Broadband
FDI	Foreign Direct Investment
FX	Foreign Exchange
GDP	Gross Domestic Product
GDPR	General Data Protection Regulation
GW	Gigawatt
ICT	Information, Communications and Technology
IFC	International Finance Corporation
IMF	International Monetary Fund
IPP	Independent Power Producer
IRR	Internal Rate of Return
IT	Information Technology
IXP	Internet Exchange Point
Km	Kilometer
kW	Kilowatt
kWh	Kilowatt hour
LLM	Large Language Models
MNC	Multinational Corporation
MNO	Mobile Network Operator
MRR	Monthly Recurring Revenue
MSP	Managed Service Provider
MW	Megawatts
OEM	Original Equipment Manufacturer
PoP	Point of Presence
PUE	Power Usage Effectiveness
RFS	Ready For Service
SSA	Sub-Saharan Africa
USD	US dollar

1. THE RISE OF AFRICAN DIGITAL INFRASTRUCTURE



African Internet markets are witnessing a period of unprecedented change, a phase of deep-seated transformation in the scale, depth and nature of digital services adoption. Following a decade of expansion, Africa's digital infrastructure is unquestionably larger, deeper and more resilient than it has ever been, and the bedrock of a digital economy loosely estimated at $150bn a year and growing.[1]

HIGHSPEED BROADBAND – THE AGE OF 4G, 5G AND FIBER

African Internet usage continues to expand. At the end of 2024, the number of broadband connections in the region crossed the 800 million milestone, almost twice the subscriber volumes just five years earlier. A decade of infrastructure build has transformed the region's digital landscape. As highspeed broadband penetration has increased, data traffic volumes have exploded and continue to rise by nearly 30% a year.

Mobile operators have expanded their networks, adding thousands of cell towers to cover around 80% of the region's population with 4G technology. More markets are moving to the next technology phase and deploying 5G, with a core focus on densely-populated urban centers. Last mile fiber to the home connections are gradually complementing wireless broadband; in 2024, last-mile fiber networks passed more than 18million homes and businesses across Africa, upending traditional highspeed Internet access models. Likewise, the increased adoption of satellite Internet services such as Starlink has expanded the scope of broadband options available to end users, further boosting Internet usage.

SUBMARINE CABLES

A dozen submarine cables have landed on sub-Saharan Africa's coastlines since 2010, including new "mega" cables such as Equiano, PEACE and 2Africa. The new cables have ushered in a new phase of growth for African international capacity, bringing in an unprecedented flow of new capacity (more than 200 Tbps of potential, "design" capacity), expanding diversity and resiliency and opening new routes to Asia and the Americas. Beyond providing capacity at scale, the new submarine cable deployments are upending African historical capacity acquisition models in fundamental ways, slashing average capacity costs and compelling open access models in bandwidth sales and cable landing points.

[1] *Extrapolated from Google/IFC 2020 e-Conomy assessment*

TERRESTRIAL FIBRE

Long a critical bottleneck in Africa's Internet connectivity, terrestrial fibre transmission continues to expand, with deployments reaching 1.4 million kms in 2024. On average, sub-Saharan Africa fiber providers have been adding an average of 40,000 to 50,000 kms of new deployments every year.

New terrestrial corridors are emerging to provide low latency routes for intra-Africa traffic and connect landlocked countries to coastal cable landing stations. Similarly, a host of initiatives are underway to connect Africa's East coast to its West coast with terrestrial fiber, thus creating new paths for Asia to Americas traffic.

CONNECTIVITY GAPS REMAIN

Despite this remarkable progress, however, considerable gaps remain across the connectivity, hosting and applications value chain.

The first is a digital inclusion gap. Median broadband penetration in the region was around 50% at the end of 2024, according to Xalam Analytics estimates. Accounting only for 4G and wired connections higher than 5Mbps, median African broadband penetration falls to 35%. Across sub-Saharan Africa, nearly half of the population does not use highspeed broadband despite being covered by 4G networks, due to cost, a lack of broadband-capable terminals and other factors, laying bare gaping digital divides between urban and rural areas and between consumer income groups.

Africa also faces a considerable infrastructure scale gap, as already skyrocketing data volumes rise further. With the broadband base set to cross the 1 billion mark by 2030, African traffic volumes are projected to expand 3x and potentially higher, depending on the depth of artificial intelligence (AI) adoption. Managing such a traffic onslaught will require a step-change expansion in tower infrastructure, fiber density and data center capacity.

Africa's competitiveness is also at stake, in a fast-changing global market. As a percentage of GDP, Africa's digital economy is one of the smallest in the world. As the world moves through the next technology platform shift, from the age of cloud to the age of AI, the need for a new wave of investment to bolster the region's connectivity and data center hosting infrastructure has become ever more acute.

THE STATE OF AFRICAN DIGITAL INFRASTRUCTURE: AN OVERVIEW

Estimates as of January 2025[1]

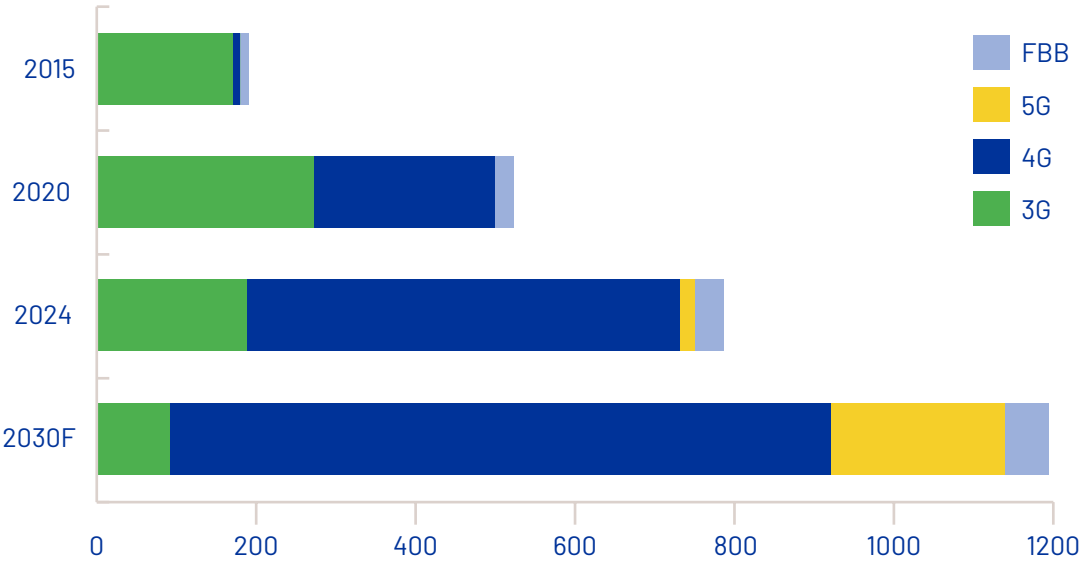
1.4M Kms of terrestrial fiber[2]	**18M** Urban homes passed with fiber	**225,000** 4G/5G Cell sites	**8** Live public cloud regions
~200 Live commercial data center facilities[3]	**~500MW** Live critical IT load[4]	**57** IXPs[5]	**175** CDN & Cloud PoPs[7]
~55 Subsea cables[6]	**~110** Subsea cable landing points[6]	**~125 TBPS** Equipped/Lit international capacity	**2** Starlink ground stations

[1] *Numbers are Xalam Analytics estimates unless otherwise indicated; numbers are rounded up.*
[2] *Total fiber network in kilometers (incl. backbone, metro and FTTX); includes both owned and leased capacity through partnerships. Some kilometers may be double-counted.*
[3] *Commercial facilities only, estimated at Tier III standard or above*
[4] *Commercial facilities only*
[5] *Africa IXP Association*
[6] *Africa-focused cables only, and/or with landing points in at least 3 African countries*
[7] *CDN edge PoPs, cloud edge PoPs and cloud local zones or equivalent*
[8] *"Meaningful" broadband penetration including 4G, 5G and 5Mbps+ connections only.*

Sources: *Xalam Analytics estimates, provider and regulator data*

AFRICA BROADBAND CONNECTIONS BY TECHNOLOGY – 2015-30F

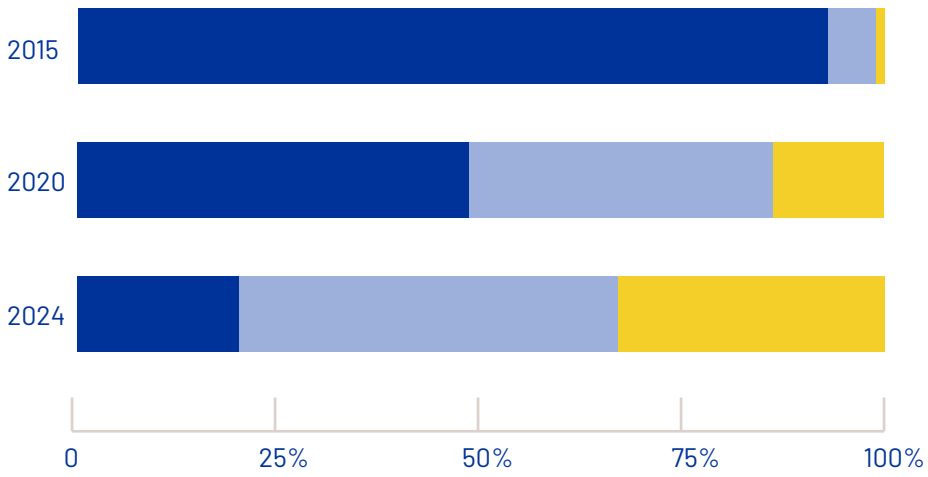
In thousand



Sources: *Xalam Analytics estimates, provider and regulator data*

AFRICA'S DIGITAL INCLUSION GAP - 2015-24

% of the African population – based on 4G



CONNECTED: *population with an active broadband connection (using 4G technology or above)*

NOT COVERED: *population not covered by 4G networks*

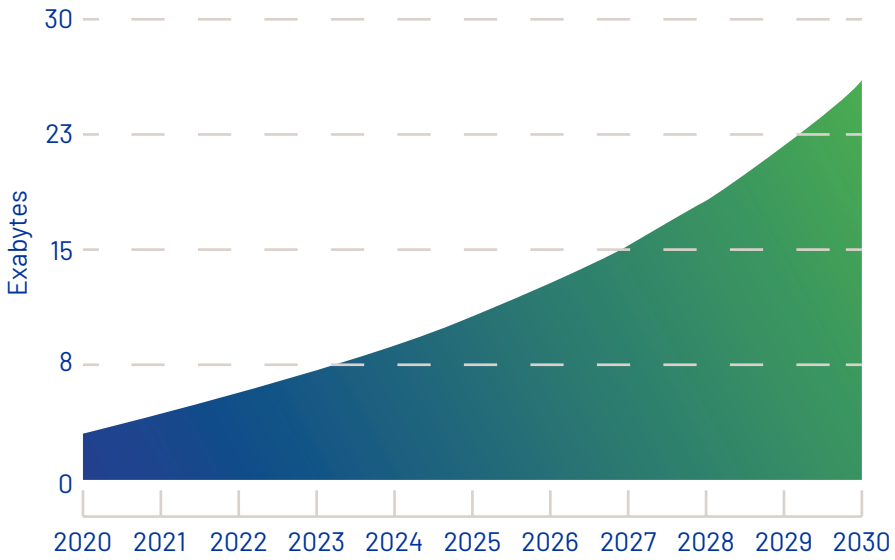
COVERED BUT NOT CONNECTED: *population within area of coverage of a 4G network, but without an active connection, due to lack of affordability (of data and smartphones), unavailability of relevant content, education or other factors.*

**Penetration estimates based on 4G-speeds and above.*

Sources: *Xalam Analytics estimates, provider and regulator data*

AFRICA'S DATA TRAFFIC FORECAST – 2020-30

Monthly traffic – in Exabytes



**Penetration estimates based on 4G-speeds and above.*

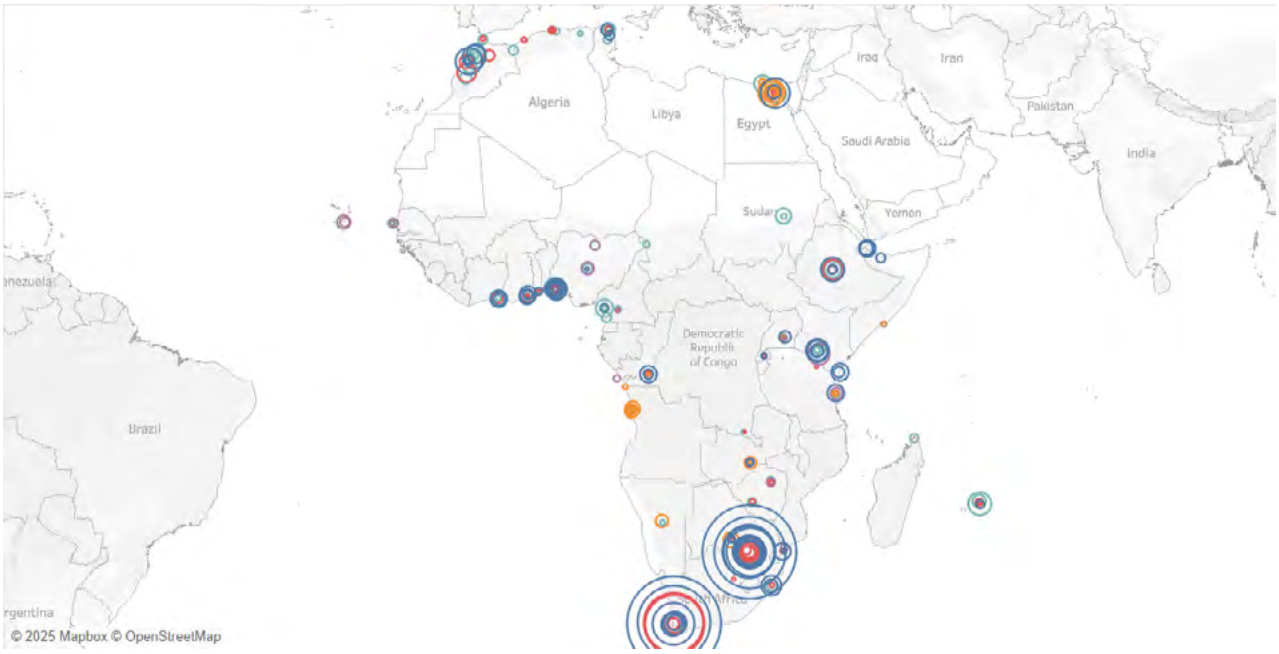
Sources: *Xalam Analytics estimates, provider and regulator data*

2. THE AFRICAN DATA CENTER OPPORTUNITY

Africa's hosting capacity is witnessing similar dramatic improvement, the result of considerable investment to host user content within the region and reduce costly international transit fees. Around 80 commercial data center facilities at Tier III standard or above have come to market across Africa since 2020, bringing in nearly 300MW of fresh hosting capacity and supporting the development of local Internet exchanges.

The new hosting capacity is providing the foundation for Africa's evolving public cloud infrastructure. The region is now home to 8 public cloud regions and nearly 200 edge and content delivery network points of presence, with another wave of deployments expected to come to market by 2030.

AFRICA – COMMERCIAL DATA CENTER FACILITIES – 2024



Each circle represents a commercial data center facility; circle size reflects facility size in MW.
Sources: *Xalam Analytics estimates; Company data.*

DEFINING AFRICAN DATA CENTER MARKET CLUSTERS

African data center markets are highly diverse. On the demand side, markets have a variety of customer profiles, from large-scale economies attractive to global hyperscalers to predominantly enterprise-driven demand. On the supply side, market conditions similarly vary, from highly flexible and liberalized operating environments to more constrained, highly-regulated marketplaces.

To better assess the African data center investment opportunity, markets are categorized based on maturity and scale. The table below describes key market cluster characteristics.

	KEY TIER CHARACTERISTICS	SAMPLE COUNTRIES [1]
Tier 1 – Core Hyperscaler Market	Large content and enterprise demand; connectivity + economic hub; home to multiple full-stack cloud regions	South Africa
Tier 2 – Secondary Hyperscaler Market	Large content and enterprise demand; connectivity + economic hub; potential home to 1-2 full-stack public cloud regions	Kenya Nigeria Morocco Egypt
Tier 3 – Upper-high Cloud Potential	Large GDP base, potentially large enterprise demand, but held back by other factors (e.g. regulation); economic (but not connectivity) hub; some moderate potential for multiple cloud/content edge PoPs under optimal conditions	Cote-d'Ivoire Ethiopia Tanzania Angola
Tier 4 – Medium-high Cloud Potential	Moderate to small enterprise demand; predominantly enterprise, with potential for 1-2 edge PoPs under optimal conditions	Ghana Senegal DRC Uganda
Tier 5 – Lower scale Cloud Potential	Small-scale, predominantly enterprise and network demand	Mozambique Rwanda

Source: *Xalam Analytics research.*
[1] Sample countries only. All other countries fall into Market Tiers 4 or 5.

AFRICAN DATA CENTER MARKET GROWTH, BY COUNTRY TIER

Key indicators by country tier – % of Africa total - 2024E [1]

	Key countries	% of population	% of GDP	% of BB connections	% of data center IT load	Projected revenue CAGR – 2024-30F	
Tier 1 - Core Hyperscaler Market	South Africa	3%	17%	10%	70%	~15%	Africa's largest and most competitive market; extensive pipeline, to be supported by potential AI upside.
Tier 2 – Secondary Hyperscaler Market	Kenya Nigeria Morocco Egypt	36%	34%	40%	15%	~25%	Other large markets are catching up; will see biggest growth outside of South Africa, but upside is highly dependent on hyperscaler deployments; fastest-projected growth
Tier 3 – Upper-high Cloud Potential	Cote-d'Ivoire Ethiopia Tanzania Angola	25%	29%	25%	5%	~20%	Promising markets, still lagging on supply and demand; second-fastest growth across all clusters
Tier 4 & 5 – Medium and lower scale cloud potential	Ghana Senegal DRC Uganda Mozambique Rwanda	35%	20%	25%	10%	~16%	Good upside but more constrained growth, largely tied to small demand scale

[1] *Percentages may not add up to 100%*

Sources: *Xalam Analytics estimates, provider data; population and economic data from statistical offices, IMF; broadband data based on Xalam, provider and regulator data*

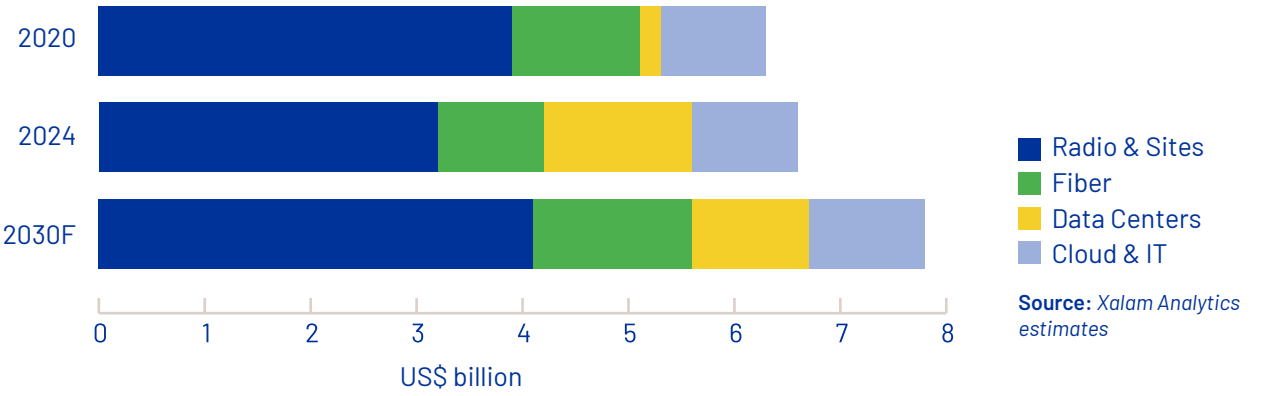
3. AFRICA DIGITAL INFRASTRUCTURE INVESTMENT REQUIREMENTS

A MULTI-BILLION DOLLAR CAPITAL REQUIREMENT FOR AFRICAN DIGITAL INFRASTRUCTURE BUILDOUT

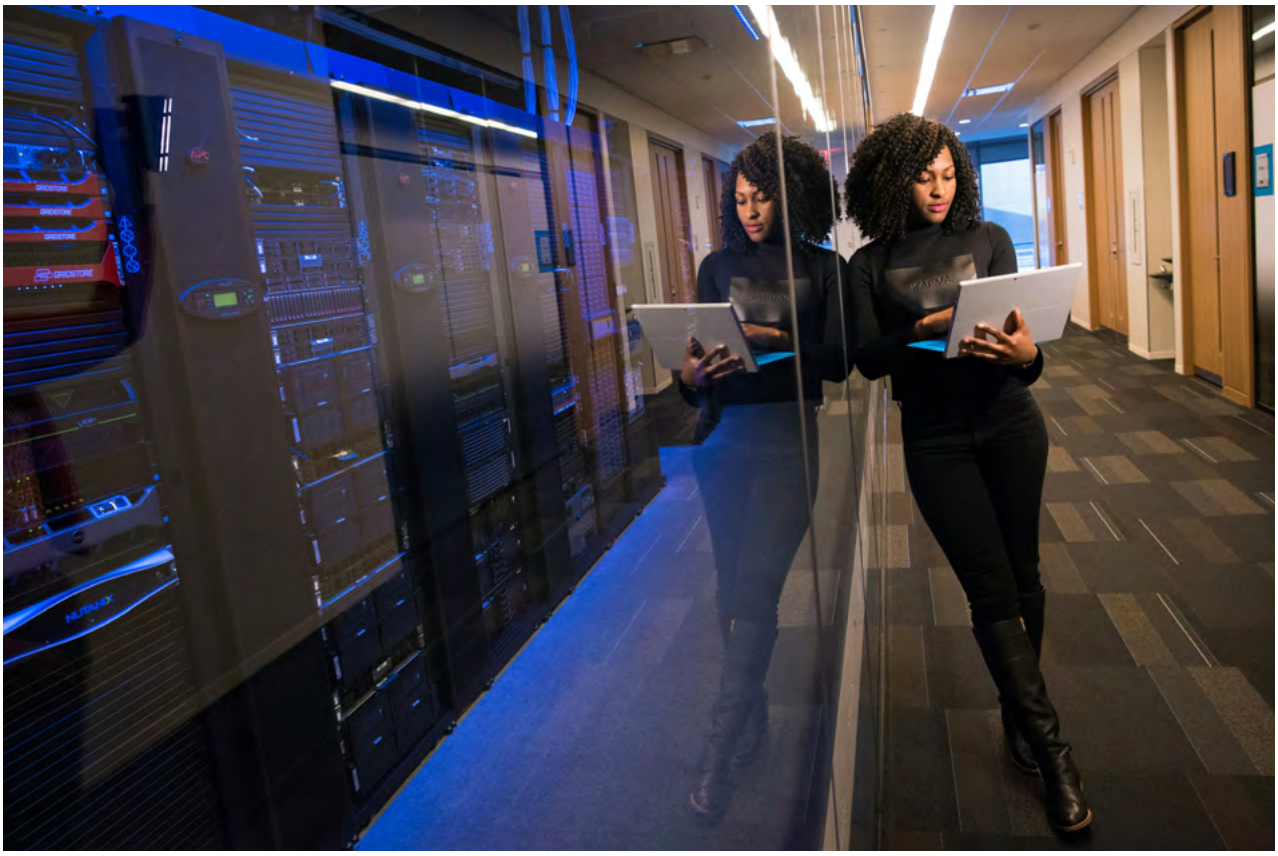
Capital spending on digital infrastructure in Africa has been considerable. Sub-Saharan African Digital infrastructure capex reached an estimated $7bn in 2024, according to Xalam Analytics estimates, on the back of broadband network expansions, terrestrial and subsea cable rollouts and deployments of the region's largest data center facilities. About 60% of the investments went to mobile networks to support 4G and 5G network coverage and capacity expansion. Fiber deployments have been the second biggest area of investment, with nearly 20% of capex going to terrestrial and subsea network build. By contrast, investment in data centers has been relatively small, accounting for less than 7% of total capex over the past four years.

A similar capital investment effort will be needed to sustain the region's infrastructure expansion. Estimates by Xalam suggest that the region's providers will need to spend around $7b-$8bn annually over the 2025-2030 period, with fiber, data centers and cloud attracting nearly half of that investment.

SUB-SAHARAN AFRICA DIGITAL INFRASTRUCTURE CAPEX EVOLUTION – US$ BILLION



Source: *Xalam Analytics estimates*



CLOUD AND DATA CENTER CAPITAL REQUIREMENTS

The capital requirements for expanding data center infrastructure are especially notable. The Xalam data suggests that African data center providers have deployed nearly $2.6bn over the past five years in data center construction projects.

To support the projected construction and anticipated pipeline in sub-Saharan Africa, Xalam estimates that the industry would need an additional $6bn in data center capex by the end of the decade (and more than $10bn including cloud and IT solutions).

The new construction would double the region's hosting capacity to around 1GW of critical IT load, through the deployment of dozens of modern facilities anchored by green sources of power across large and small economies alike. New investments would materially increase the density capabilities of African data centers, enhance their cooling capabilities and bolster the region's ability to serve AI workloads.

4. FINANCING AFRICAN DIGITAL INFRASTRUCTURE: EXPECTATIONS AND KEY PATTERNS

THE CHALLENGE OF FINANCING AFRICAN DIGITAL INFRASTRUCTURE CAPEX – DEBT, EQUITY AND RETURN EXPECTATIONS

Coalescing capital for digital infrastructure capex would require extensive collaboration between private and public sources of capital, a level of partnership at least matching the already considerable efforts of the past decade. An analysis of a sample of 30 financing transactions of fiber and data center providers across Africa shows transaction volumes around $5-$6bn over the past five years.

About 30% of the transactions have come through various debt instruments, with the balance coming through equity transactions. Similarly, the analysis shows that private sector external financing flows in digital infrastructure assets have predominantly come from development finance institutions (DFIs) such as IFC, Proparco and Finnfund, and private equity groups like Helios and Africa50.

While there is limited data on effective investor returns, given the early-stage nature of most investments, an assessment based on informal investor insight and Xalam project work suggests that investors in African digital infrastructure assets will generally seek an internal rate of return (IRR) between 15% and 25%, depending on their cost of funds and the risk profile of the asset. In general, IRR expectations on African transactions are higher than in more developed markets, typically due to a higher risk premium.

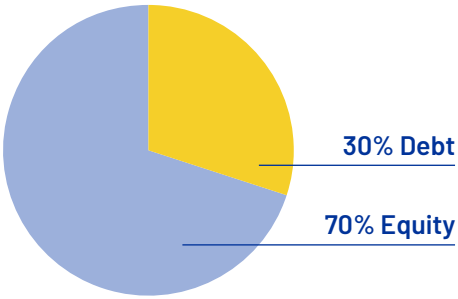
In addition, there is a high degree of variation in IRR expectations depending on the market. In general, investor IRR expectations are higher in West and Central Africa, due to the perception of higher risk profile in those markets, typically tied to inflation, foreign exchange and geopolitical risk. African IRR expectation targets are likely to remain in flux as global market volatility persists and interest rates remain elevated.

SAMPLE DATA CENTER FINANCING TRANSACTIONS IN SUB-SAHARAN AFRICA

Company	Year	Digital infrastructure focus	Lead Investors	Financing type
Raxio	2023	Data centers	Proparco, Ninety One	Debt
PAIX	2022	Data centers	Africa50	Equity
IX Africa	2022	Data centers	Helios	Equity
Cassava	2024	Fiber/Cloud/Data Centers	DFC, Finnfund	Equity
iColo	2019	Data centers	Digital Realty, Pembani Remgro Infrastructure Fund	Equity
Paratus	2023	Fiber, Data centers	Emerging Africa Infrastructure Fund (EAIF), Ninety One	Debt
MainOne	2022	Fiber, Data centers	Equinix	Equity
Teraco	2022	Data centers	Digital Realty	Equity
Africa Data Centres	2021	Data centers	Development Finance Corporation (DFC)	Debt
Onix	2021	Data centers	AIIM	Equity
Medallion	2021	Data centers	Digital Realty, Pembani Rengro Infrastructure Fund	Equity
WIOCC	2021	Fiber, Data centers	IFC	Equity
WIOCC	2020	Fiber, Data centers	Proparco	Debt
Rack Centre	2020	Data centers	Actis	Equity

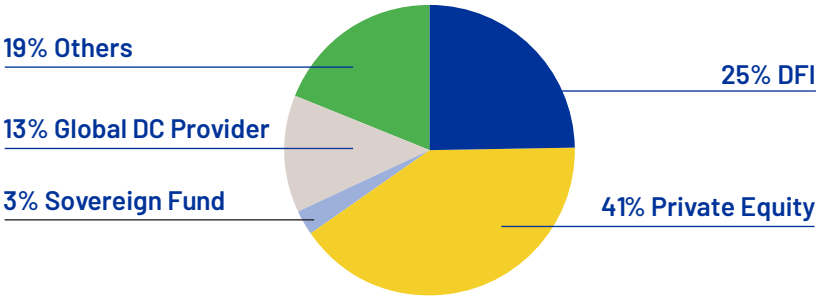
Sources: *Company and press reports*

DISTRIBUTION OF AFRICA DIGITAL INFRASTRUCTURE TRANSACTIONS BY TYPE OF FINANCING INSTRUMENT



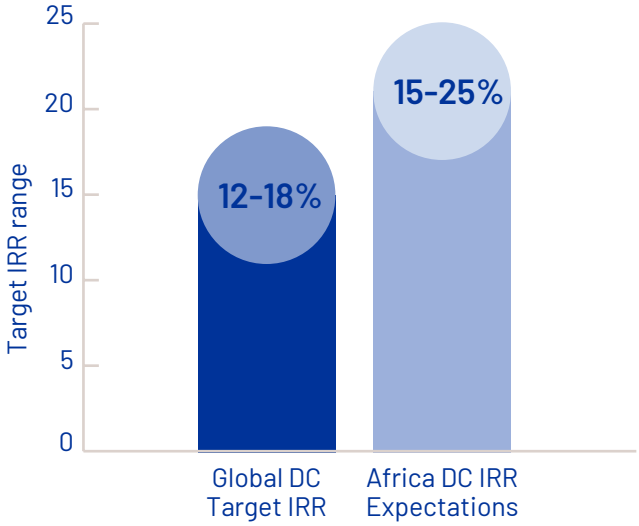
[1] *Based on 30 transactions of digital infrastructure assets over the 2019-2024 period. Numbers are proximate.*
Source: *Xalam research*

DISTRIBUTION OF AFRICA DIGITAL INFRASTRUCTURE FINANCING TRANSACTIONS BY SOURCE OF FUNDS



[1] *Based on 30 transactions of digital infrastructure assets over the 2019-2024 period. Numbers are proximate.*
Source: *Xalam research*

IRR TARGET EXPECTATIONS – AFRICA VS. GLOBAL DC PROVIDERS



Sources: *Houlihan, Xalam estimates*

INVESTMENT RETURNS OUTLOOK

As more capital flows into Africa's digital infrastructure, a number of factors will impact returns and development yields in the region's data center space:

- The timing and scale of cloud hyperscaler infrastructure deployments; cloud providers' first cloud regions in East and West Africa are anticipated around 2026-28, with an expected impact across the region's broader IT ecosystem.
- The pace of ramp-up in enterprise migration to cloud and colocation services, which would increase occupancy and improve development yields.
- The potential impact of AI adoption in the region – while still at nascent stage, the increased adoption of generative AI tools and the potential deployment of AI training and inference tools in the region would considerably boost demand for data center capacity.
- The depth and intensity of competition is expected to impact pricing further, splitting the market into dominant, large-scale providers serving wholesale and hyperscaler customers, vs. a potentially more volatile retail and low volume customer base.

05.CONCLUDING REMARKS

African countries face a broad, multi-formed spectrum of challenges in their efforts to leverage digital technologies to diversify their economies and accelerate economic development. The scale of investment is gigantic – upwards of a cumulative $50bn over the next decade in making the region cloud and AI-ready, with the deployment of hundreds of kilometers of fiber links, the densification of 4G, 5G and last mile fiber networks and the doubling of the region's data center capacity to more than 1GW.

Daunting as these requirements may seem, so critical is the imperative that more African countries are initiating the arduous journey through digital transformation. Others will follow, providing a continent-scale testbed for how emerging economies can leverage digital tools to accelerate economic growth.

Government execution will remain critical, from fast-tracking infrastructure development to unshackling connectivity markets, building clean energy foundations, relaxing access to grid and off-grid power and setting a clear regulatory path for data hosting, management and transfer. Similarly, investors will have to adapt, by assessing African opportunities on their own, intrinsic merits, being creative with financing models, and overall taking a patient view in an environment where long term returns seem as compelling as the short term is uncertain.

There is much at stake, including Africa's place in a global future underpinned by compute and clean energy. In a world where widening geopolitical fractures and global trade headwinds are increasingly spilling into efforts to deploy new technologies, this is also, arguably, Africa's most compelling investment opportunity of the next decade, outside of the extractive sector.

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