THE AFRICAN DATA CENTER RISES

HOW THE RACE TO THE CLOUD IS TRANSFORMING AFRICAN COLOCATION MARKETS

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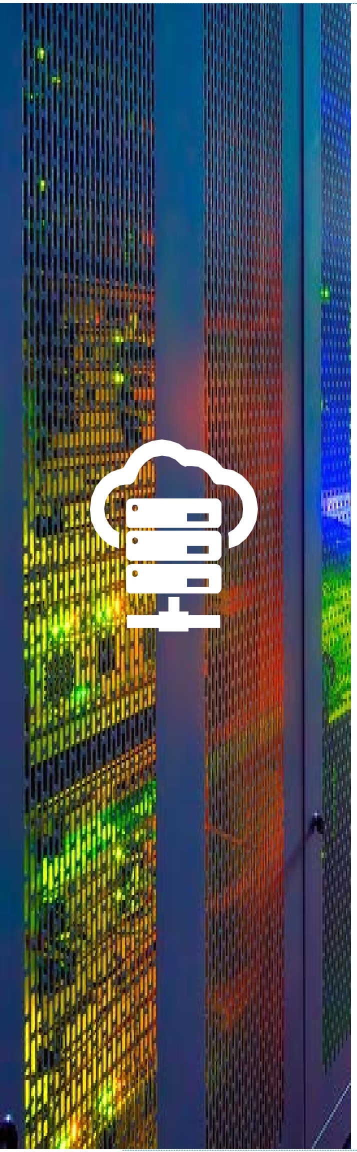
JUNE 2017

Report Summary: The African Data Center is Still Rising



- **The African Multi-Tenant Data Center (MTDC) market has entered a new phase of growth**, one that should see deeper adoption in core markets, and a broader, more distributed data center service penetration beyond the core.

- **The harbingers of this impending data center market growth have been building up for years**. African broadband is booming; the number of connections has passed the 200 million mark and should grow by an average of nearly 20% over the next five years. Fiber connectivity prices are declining, workload migration to the cloud is accelerating, data privacy and sovereignty concerns are gaining ground, and a new breed of consumer and enterprise digital natives are putting new demands on African Internet networks.

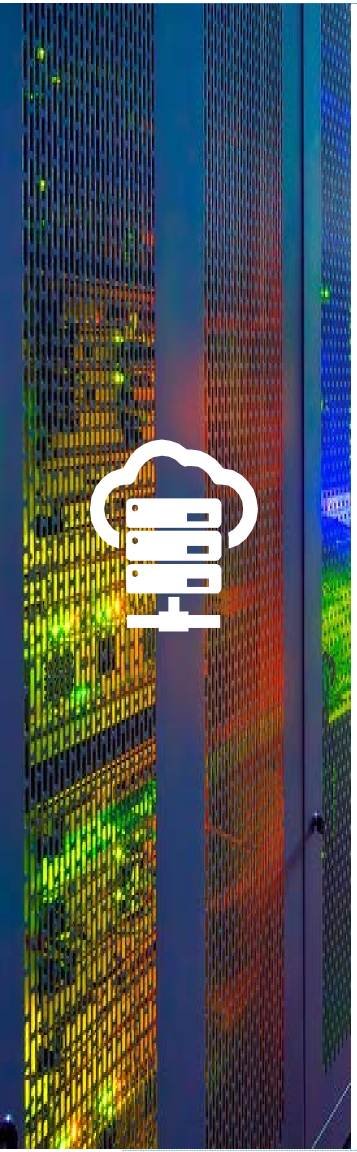
- **These and other factors are driving the race to bring the brains of the African Internet back to the continent**, in the process transforming the African data center colocation business into one of the hottest growth segments in the African ICT market. This transformation is at the heart of this report, the second edition of our “Africa Data Center Rises” series.

- Leveraging months of research, dozens of interviews, extensive data collections and new analytical tools for data center analysis and geo-mapping, the “African Data Center Rises – How the Race to the Cloud is Transforming African Colocation Markets” report **provides an unprecedented view into the dynamics underpinning the African MTDC colocation market.**

- **The report explores key questions surrounding the African MTDC colocation market** from the mundane, yet critical (how many colo data centers are there exactly in Africa, how big is the market, who are the key players), to the more incisive, if complicated (Can African colo players survive on colo only, should African telcos sell their data center assets, how much is Teraco worth, which markets are the most attractive, etc.)

- **A reference report for all players and investors in the African colocation and cloud markets.**

Sample Key Points Explored in this Report



The insights derived from our research on African data center colocation markets are distilled in this report, covering critical key questions and points, including:

- Why we say that the African colocation market is really, primarily, about 7 core markets – and what those countries are;
- Why we say that almost half of African MTDC facilities are really built to do other things – and why that is;
- Why we say that less than 10% of African MTDC facilities are “True” Carrier and Vendor-Neutral MTDCs – and what the implications are;
- Why we say that outside of the South African market, Africa has low levels or “realized demand”;
- Why we say that power supply remains a challenge for African colo players; but argue that connectivity is the bigger problem;
- Why we say that MTDC colocation is one of the hottest growth segments in the African ICT market;
- Why we say African colo markets are small and complicated – but carry substantial upside for those who will dare take them on;
- Why we say that power supply challenges do distort African data center economics – and hamper the long-term margin upside of this business;
- Why we say that African colocation isn’t a case of build it and they will come. You may build it, but absent other critical conditions, it will stay empty;
- Why we say that African telcos should consider selling their data center assets – though doing so will have no material impact on their balance sheets;
- Why we say, about South Africa’s Teraco – “Show them the Money”;
- Why international colo operators are not here yet – and why they are coming;
- And more..

The Corporate/Premium version of this report includes more than 50+ supporting charts and data points in Excel format (See Report Specs).

Report Structure Overview

1. HOW MANY MTDCs ARE THERE IN AFRICA?

2. WHAT IS THE SIZE OF THE AFRICAN COLOCATION MARKET?

3. WHAT IS THE DEMAND POTENTIAL FOR AFRICAN MTDC COLOCATION?

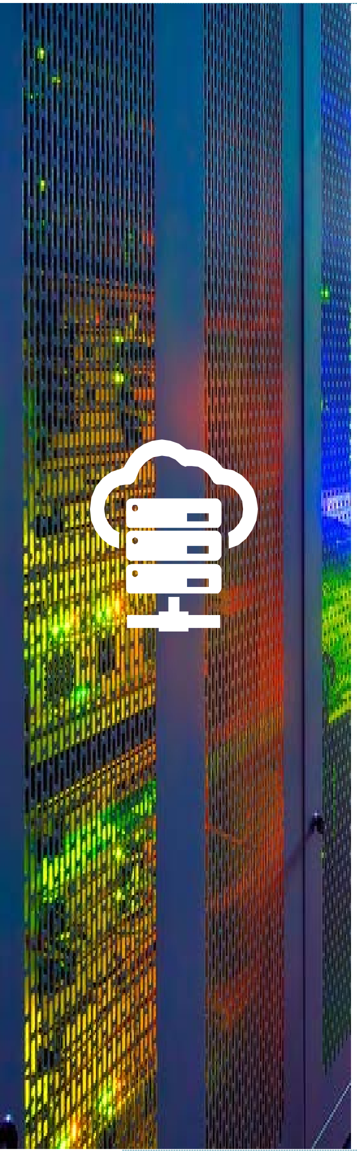
4. WHAT IS THE REVENUE SIZE & OUTLOOK FOR AFRICAN MTDC COLOCATION?

5. THE COMPETITIVE STRUCTURE OF THE AFRICAN MTDC COLOCATION MARKET: OF “TRUE” CARRIER-NEUTRAL, TELCO DCs, AND IT PLAYERS

6. PART II – BEHIND THE NUMBERS: ANSWERING KEY QUESTIONS

7. PART III – COUNTRY FOCUS ANALYSIS

Markets & Companies Covered



This report focuses on Africa at a broad level, with countries covered at varying levels of depth. Countries and players covered are as follows:

Markets Covered with Good Depth

- The core analysis of the report is driven by insights and data generated primarily from these markets;
- We provide a country-focused analysis of colo market size, key players, estimated market share, revenue outlook
- Specific country-focused profile, key trends, projections and other analysis:

- South Africa
- Kenya
- Nigeria
- Morocco
- Tunisia

Other Markets Covered

- The core analysis of the report is driven by insights and data generated primarily from these markets;
- At a minimum, some top line numbers and projections are provided in specific colo size tables;
- Key trends and dynamics are explored and highlighted throughout the report - but no specific country profiling

- Ghana
- Egypt
- Ivory Coast
- Cameroon
- Mauritius
- Angola
- Tanzania
- Zambia
- Mozambique
- Senegal

Companies Mentioned

- Amazon Web Services
- BCX
- CenturyLink
- Dataxion
- Digital Realty
- East Africa Data Center
- EO Data Center
- Equinix
- Etix Everywhere
- GPX
- Hetzner SA
- Hostoweb
- IBM
- iColo
- Internet Solutions
- Interxion
- Liquid Telecom
- MainOne/MDXi
- Maroc Data Center
- Microsoft
- MTN Business
- N+One
- Ooredoo Tunisia
- Orange Group
- Rack Africa
- RackCentre
- Raya Data Center
- Safaricom
- Telecom Egypt
- Telkom SA
- Teraco
- T-Systems SA
- Verizon
- Vodacom Business
- Windstream

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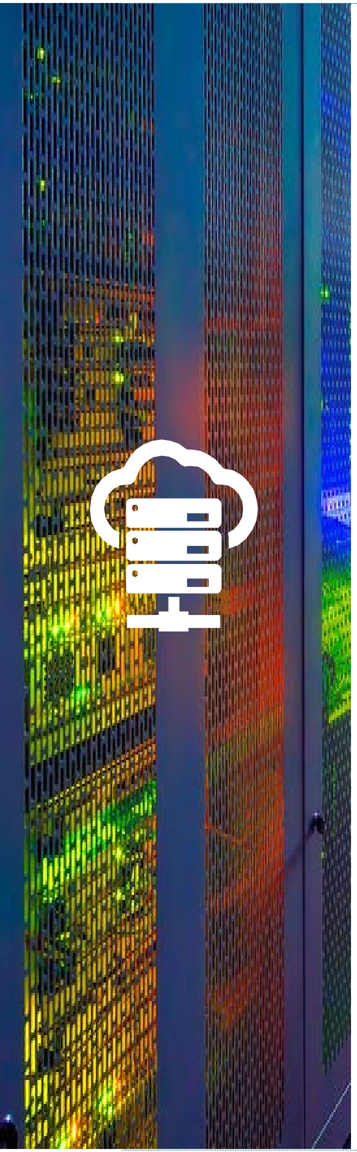

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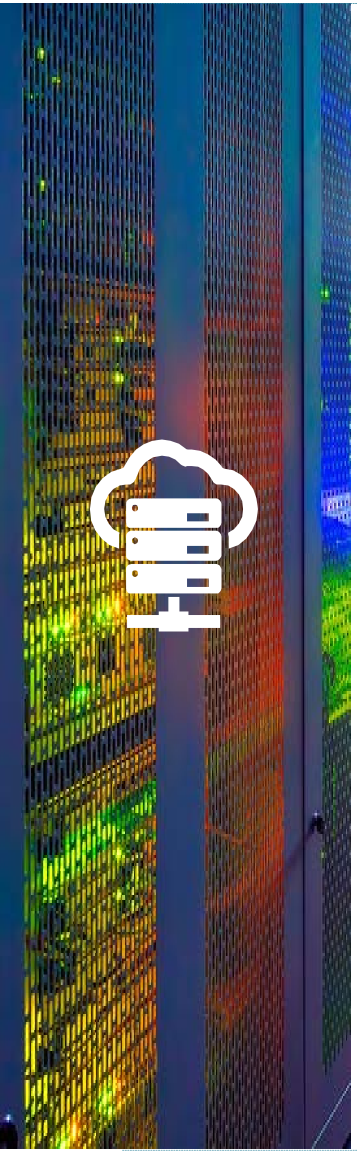
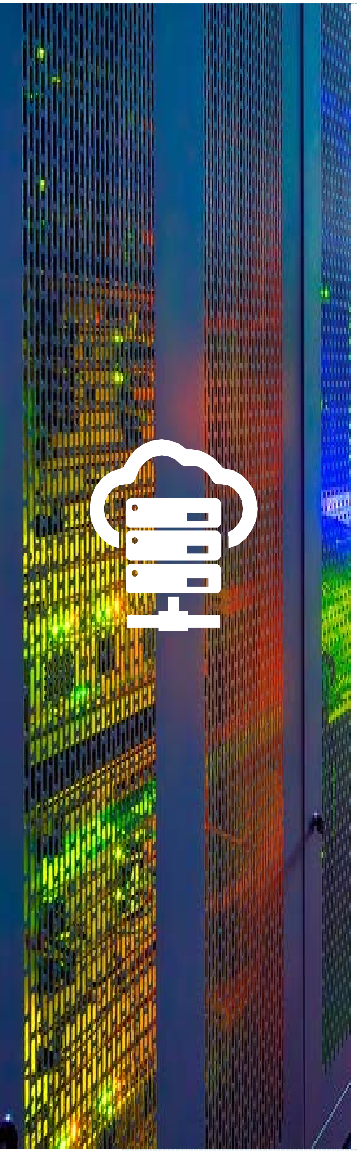
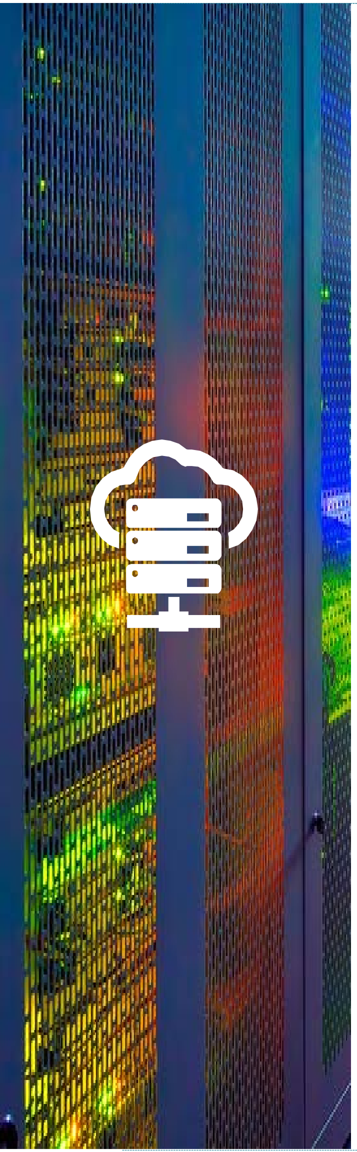


List of Exhibits (1)



List of Exhibits (2)



PART III – COUNTRY FOCUS

SAMPLE PAGES

The following are sample pages for this report, provided for indicative purposes only, with edits, and in no particular order.

Our Views in 10 Questions – And Where to Find Them

Xalam Analytics

How Many Data Centers are there exactly in Africa?

Between XXX and XXX, depending on the count and definitions. But only ~XXX are "Real", purpose-built MTDC facilities, to Tier III or Tier IV specifications; and of those, only XXX are "true" Carrier and Vendor-Neutral MTDCs.

See Pages 16-17

How big is the African colocation market?

~XXX Square meters of space, ~XXX MW of power capacity, ~$XXXm in revenue. Growing at ~XXX% annually, projected to double in size over the next five years.

See Pages 16-17

What's the demand potential?

~XXXk square meters, ~XXXk with more aggressive demand assumptions. Outside of South Africa, less than XXX% of this potential demand actually uses colocation services.

P. 32-33

Which African colo markets are the most attractive?

South Africa stands alone. On a colo space basis, it is larger than the next 20 African markets combined.

7 markets account for ~90%+ of colocation revenue: XXX, XXX, XXX, XXX, XXX, XXX and XXX. Several other markets have good demand potential, but unattractive supply-side conditions.

P. 32-33, 49-50

Which players control the African colocation market?

IT/Cloud Enterprise-focused players control ~XXX% of Africa's colo space; carrier-neutral providers manage XX% of the facilities but control ~XXX% of the space. XXX is Africa's largest colo provider and XXX is the only traditional telco in the Top 5.

P. 40-47

But What about Africa's deficient power supply infrastructure?

We say it's a challenge – not an unsurmountable obstacle. We even say the cost of metro connectivity is a bigger obstacle than power supply availability. Still, the power challenge creates a distortion of the African colocation model and will make it difficult to maximize long term margins

P. 54 – 56.

Why are the global colo players not here yet?

African colo markets are complicated, just haven't been big enough, and the paths to market entry have been narrow. But things are changing, and the global colo players are likely coming.

P. 57-59

What are Africa's best targets for colo M&A?

There are a few, from XXX to XXX. Teraco is unquestionably the best of the lot; acquiring it would be expensive. But from the baseline evidence in this report, few African tech businesses would be as worth the money as this one.

P.62-63

Can government data centers fundamentally change African colocation markets?

We do not believe so. But they'll have some (limited) use.

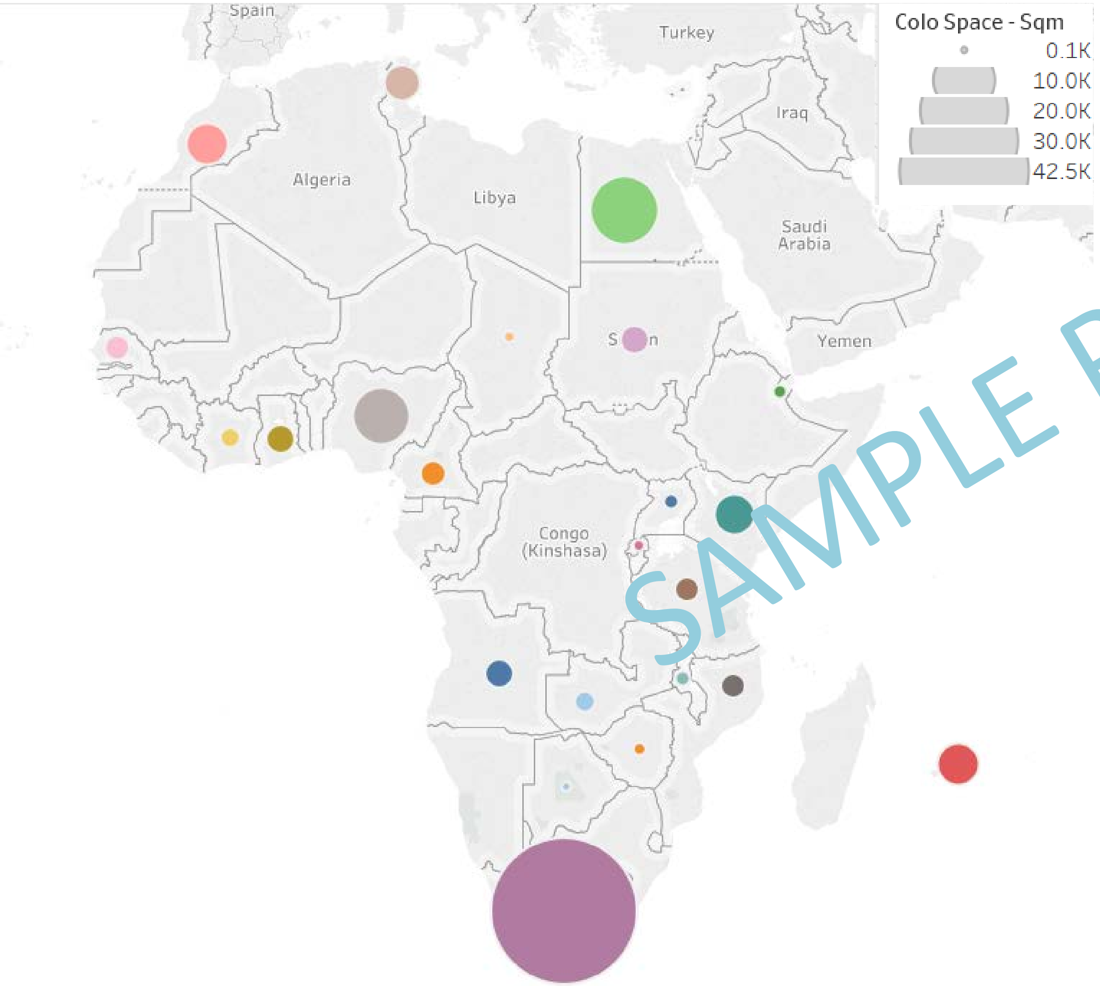
P. 64-66

Should African telcos sell their data center assets?

While there is a good operational and strategic rationale for selling, XXX, XXX, XXX

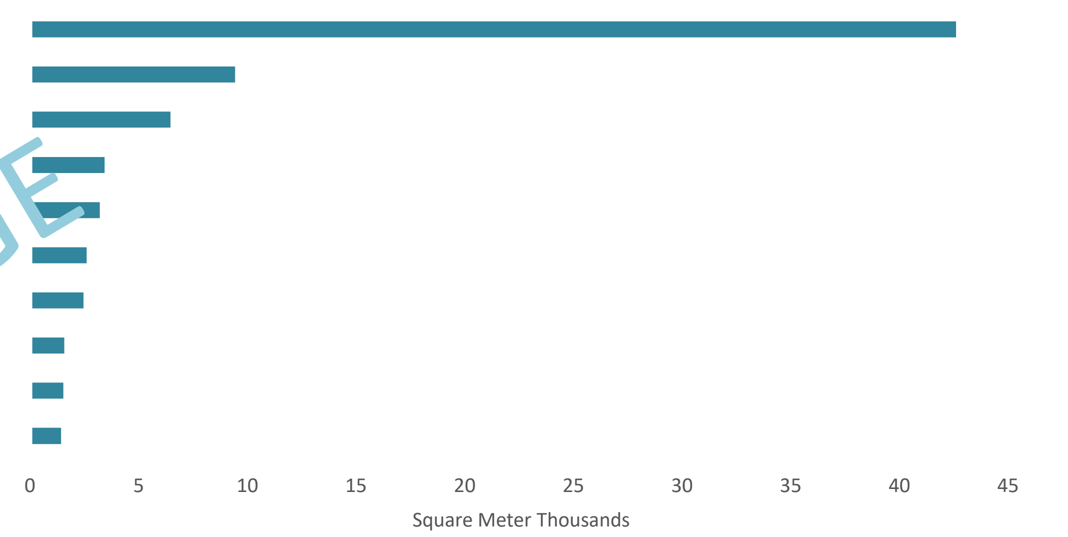
P.51-53

The African Colocation Market: A Map Review



Bubble size represents relative colo space size
Source: Xalam Analytics Research

Africa's Top 10 Colocation Markets (Countries)*



Estimates include data centers in construction and expected to launch in 2017
Source: Xalam Analytics Research

How they Break Down: Africa MTDCs by Size and Type

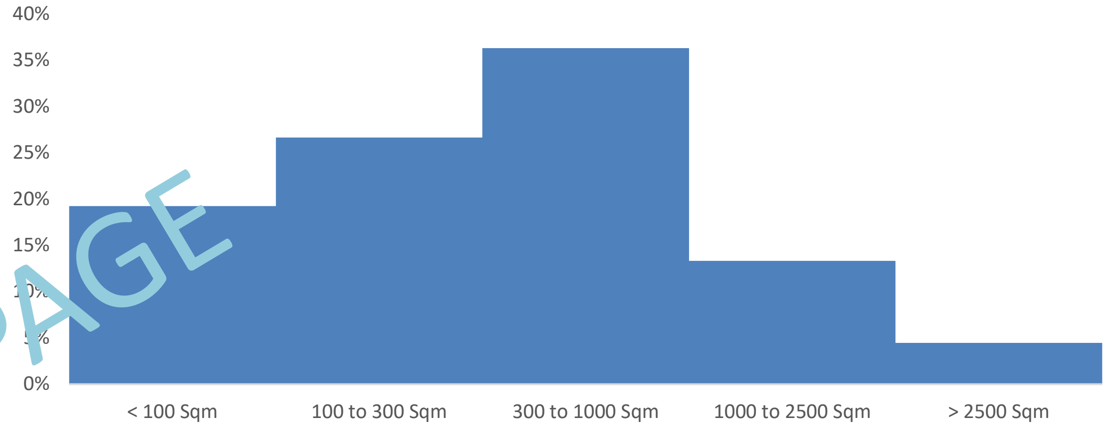
A Predominantly Small MTDC Base

- **On the whole, African data centers are small; the median size of an African MTDC is around XXX square meters** and about a fifth of the MTDCs are smaller than 100 square meters – in essence, more or less well-equipped server rooms.
- The sweet spot is nonetheless higher – **the *average* MTDC size is close to XXX square meters, and around a third of all African MTDCs fall in the XXX-XXX square meter bracket;**
- Some of the MTDCs are relatively sizeable: **~XXX African data centers have available white space above XXXX sqm, and XXX are larger than XXXX sqm.**
- **XXX of Africa's XXX largest data centers (4 of the Top 5) are in South Africa; XXX of the top XXX are in Egypt, with XXX and XXXX slotting one each in the Top 15.**
- **~XXXXX% of African MTDCs are built for a primary purpose other than commercial colocation.**

Types of Colocation Facilities in Africa*

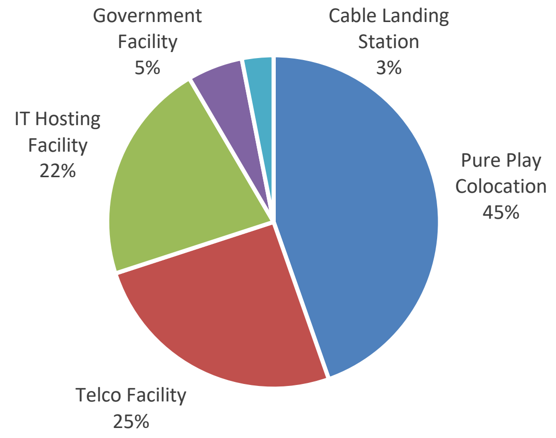
	Data Center Core Purpose
Pure-Play Colocation DC	The data center facility was built primarily to offer colocation services.
Telco Facility	The primary purpose of the facility is to house telecom company equipment; excess space is then used to offer colocation services.
IT Equipment Hosting Facility	The primary purpose of the facility is to house IT firm/other equipment; excess space is then used to offer colocation services
Government Facility	The primary purpose of the facility is to house servers from government and public institutions; excess capacity is sold to the private sector on a commercial basis.
Cable Landing Station	The primary purpose of the facility is to house submarine carrier equipment landing on the cost; some extra capacity available to other providers.

Distribution of African MTDCs by Size - (2017E)



*based on overall equipped, usable space; actual space dedicated to third-party colocation may be smaller.

Distribution of African MTDCs by Primary Purpose - (2017E)*



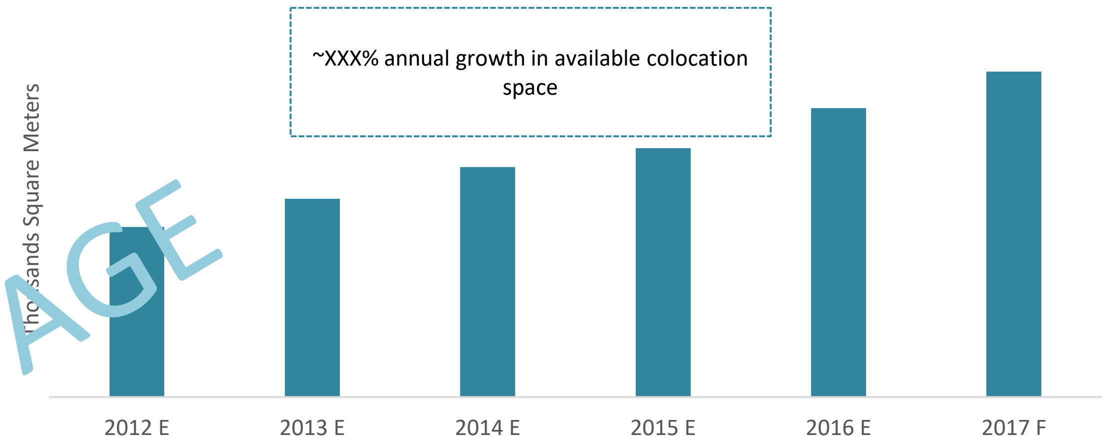
*Focus here is on the primary purpose of the facility, rather than the strategic focus or type of owner; Kenya's East Africa Data Center, for example, is owned by a fiberco; but its primary commercial purpose is to offer third party colocation services; it would fall under "pure play colocation" in this chart. Based on data as of May 2017. Sources: Xalam Analytics Research, the Companies

The African Colo Market

African Colocation – Growing Fast, but Still Small on a Global Scale

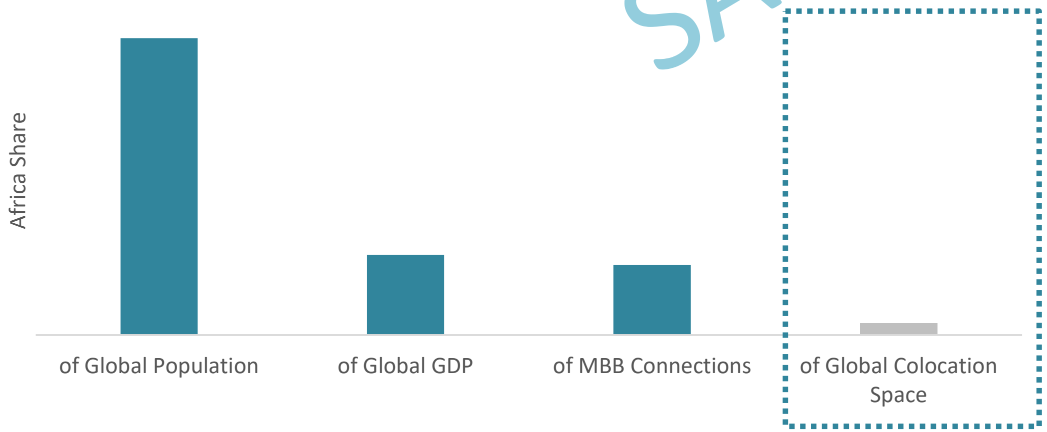
- **We estimate African colocation white space supply at around XXXX Square meters in 2017** (including new space coming to market during the 2017 year). **Overall available white space has doubled over the past five years and** has been growing by an average of around XXX% annually .
- **In relative terms, the African colocation market is small,** a reflection of the small weight of the continent on global Internet traffic – and perhaps one of the most glaring signs of an Internet marketplace still predominantly turned towards its external borders.
- **The African market is around half the size of Amsterdam, and 3.5x smaller than London.**
- **These comparisons show that ultimately, Africa (with the notable exception of South Africa) is a different type of colocation market**; colo facilities are smaller, market maturity levels are low and in many markets, supporting infrastructure is suboptimal. **On the flip side, low penetration levels mean that there is substantial upside for those who will dare take it on.**

Evolution of Africa MTDC Colocation White Space

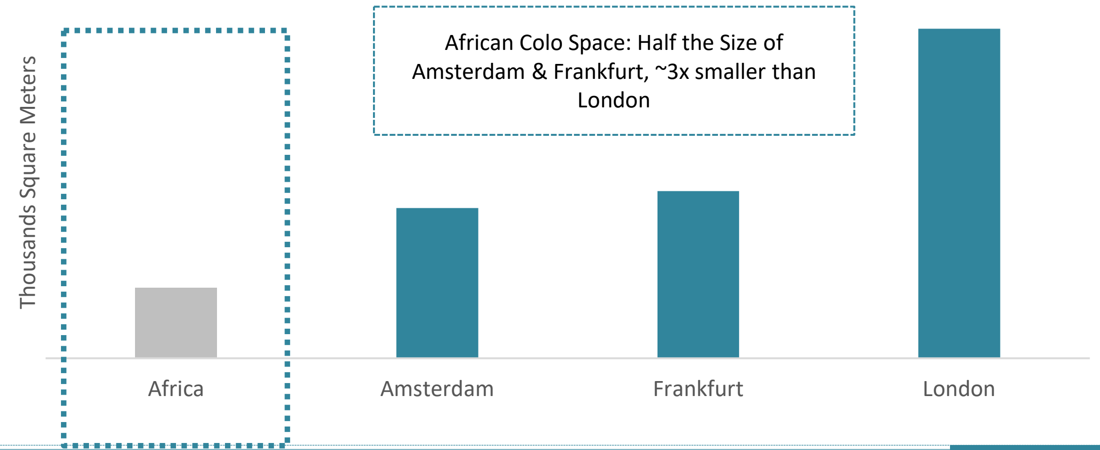


Source: Xalam Analytics Research

Africa Share of Global Population, GDP, Mobile Broadband and Colo Space



Africa Colocation Space vs. Sample Major Colocation Markets



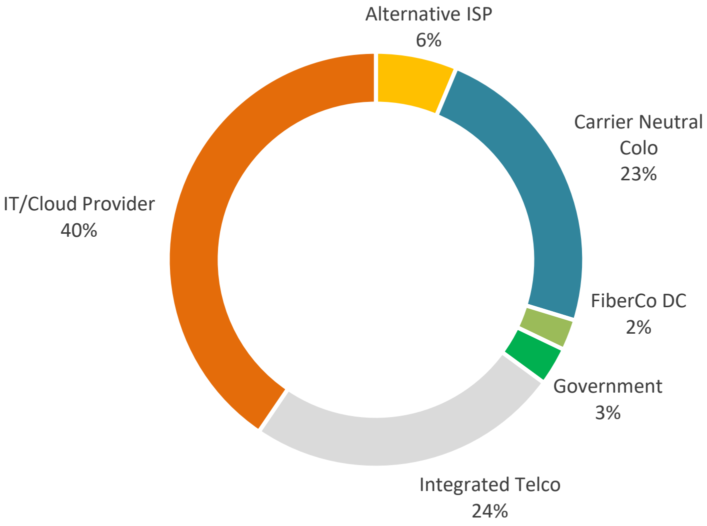
Sources: African data by Xalam Analytics Research; GDP and population data from the World Bank (2016); Global Mobile Broadband Connections from Ericsson Mobility Report (2016); Global colocation numbers are Xalam Analytics estimates

Sources: Africa: Xalam Analytics Research; Amsterdam: Dutch Data Center Association; Frankfurt and London estimated based on CBRE European Market Review (2016)

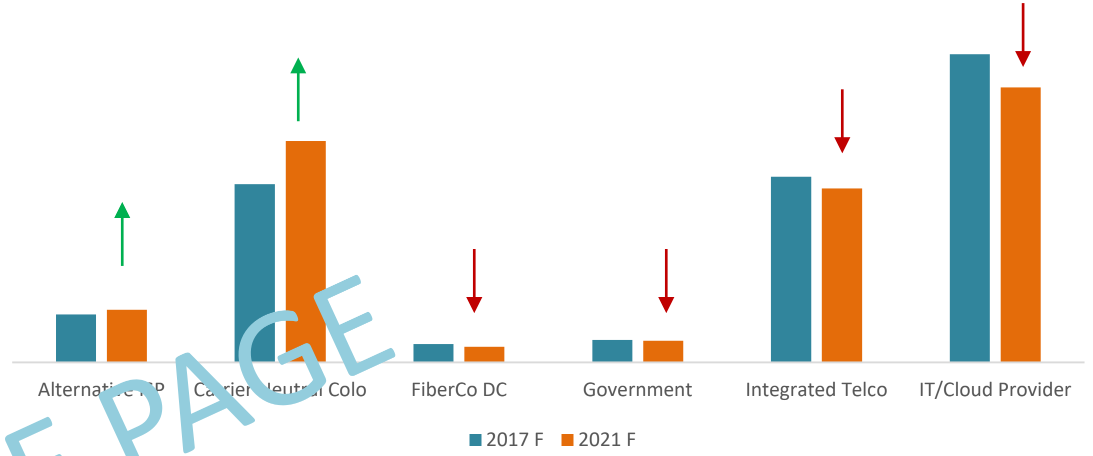
Who Controls Africa's Colo Space? A Macro View

Xalam Analytics

Who Controls Africa's Colo Space? A Broad Mapping by MTDC Player Type (2017 F)*



Share of Africa MTDC Colocation White Space – 2017 F vs. 2021 F



Market share estimates include data centers in construction and expected to launch in 2017
Source: Xalam Analytics Research

- **The differences in competitive structure between African markets are stark,** a function of substantial variations in economic structure, maturity of connectivity and industry regulation. Such differences are directly reflected in the competitive structure of African colocation markets, from the strong presence of carrier-neutral players in South Africa and North Africa to their quasi absence in most of the continent (see next page and Country Analysis).

- **At a macro-level, IT and cloud providers have long been the largest owners of African colocation capacity;** they are strong in South Africa, and until recently, were among the few providers of colocation services in many markets; today, they are seeing their turf challenged by ISPs and integrated telcos looking to build a presence in the enterprise and IT services space.

*Based on our definitions; for example, we put Internet Solutions in the IT/Cloud/Enterprise service provider group; others could put IS in the alternative ISP/Connectivity provider group.

- **Integrated telcos are the second largest group, with about a quarter of Africa's colocation space. Their overall colo space has been increasing in absolute terms, as more telcos build out data center in a bid to develop** a presence in the enterprise and IT services space. In relative terms, however, telcos have been losing share at a macro level, notably due to the fast rise of carrier-neutral options. But telcos are leaders in many individual markets, most notably in the "Other Africa" group where strong, alternative colocation offerings have yet to emerge.

- **Carrier-neutral colocation players are the fastest-growing group.** Led by Teraco, but also players such as GPX (Egypt), Dataxion (Tunisia), N+One (Morocco) or the upcoming iColo data center in Kenya, they have deployed XXXX% of all the white space rolled out in African markets over the past five years (see separate analysis).

- **We are projecting the share of most groups to decline, with one exception –** carrier neutral players, whom we expect to drive growth in the main African markets over the forecast period.

From Teraco to Emtel: Africa's Top 20 Colocation Players

Africa's Top 20 Colocation Players – Based on Owned Colocation Space - 2017 E

Sources: The Companies, Xalam Analytics Estimates

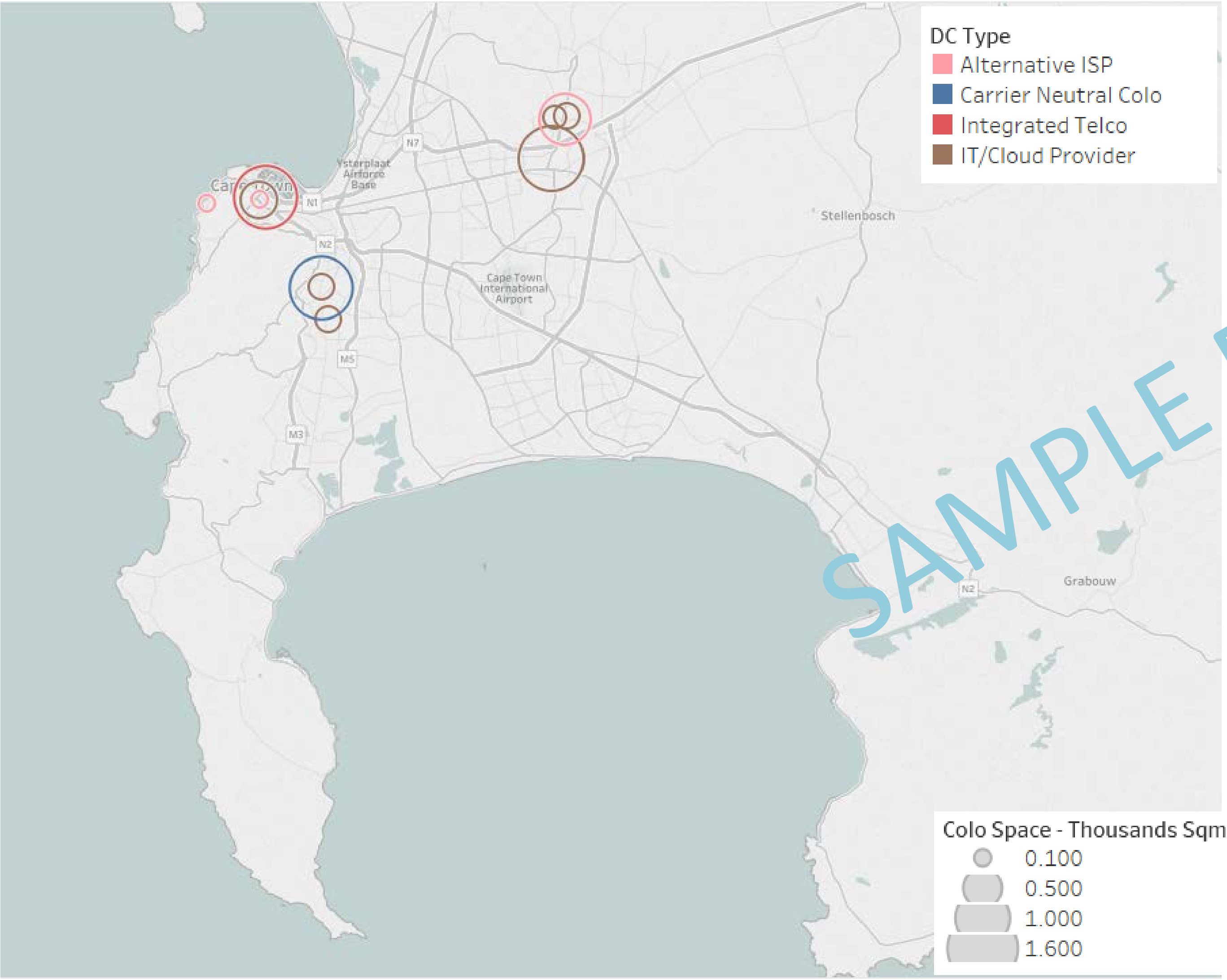
Which African Markets are Most Attractive for Colocation Services?

Xalam Analytics

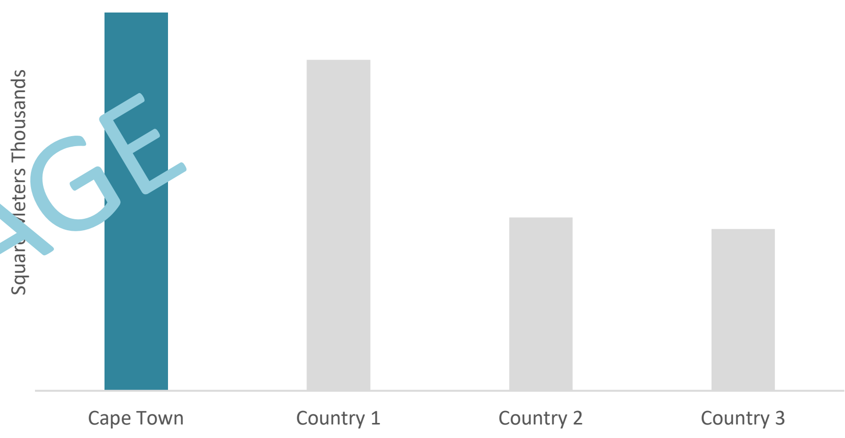
KiNG Markets & Other Africa		Size/Depth of the B2B and Carrier Market	Strategic Regional Internet Traffic Hub	Digital Services Provider Ecosystem (IT/Cloud Providers, OTTs, CDN, Video Streaming, Startups, etc.)	Reliability of the Power Grid & Alternative Sources of Power	Availability of Affordable Metro & DLD Fiber Capacity	Availability of Affordable International Fiber Capacity
KiNG Metro Markets	Nairobi	Good	Good	Excellent	Good	Average	Good
	XXXXX	Excellent	Average	Excellent	Weak	Terrible	Good
	XXXXX	Average	Average	Average	Average	Average	Good
Other Africa Metro Markets (Sample)	XXXX	Average	Average	Average	Good	Weak	Weak
	XXXXXX	Weak	Average	Weak	Average	Weak	Average
	XXXXXX	Weak	Weak	Terrible	Average	Terrible	Terrible
	XXXXXXXX	Weak	Terrible	Weak	Average	Weak	Terrible

Excellent Good Average Weak Terrible

Cape Town: More than Nice Views



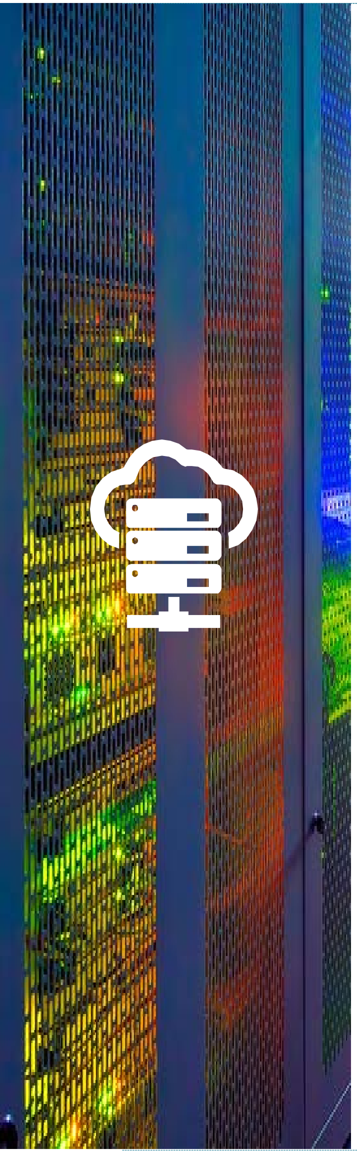
Cape Town in Context – Colocation Space Supply vs. Sample Markets (2017F)*



Source: Xalam Analytics Estimates

- Cape Town accounts for around XXX% of SA's colo supply capacity. It is Africa's third largest metro market (only behind Gauteng and Greater Cairo) in terms of available space supply.
- If it were a country, Cape Town would be Africa's third largest market, slightly ahead of XXX in terms of available supply.
- Besides a strong tourism industry, and the secondary base for South Africa's corporate customers, the region is home to a large ecosystem of digital startups.

Report Specs: 2 Budget Options



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