

AFRICA'S ONLINE EVOLUTION

TERAC@[™]
DATA ENVIRONMENTS

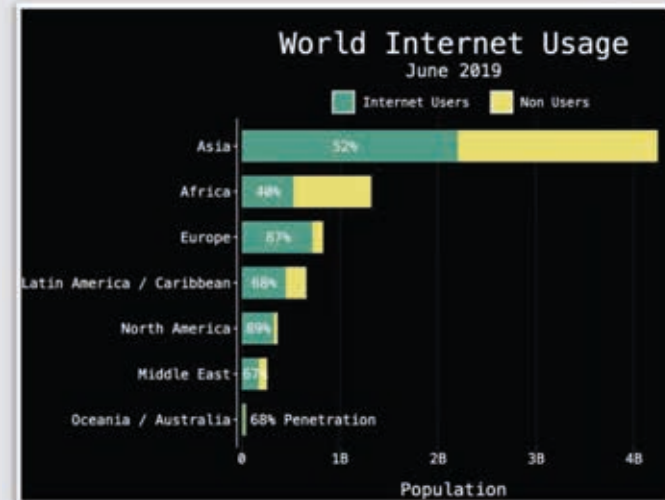


AFRICA IS ONLINE

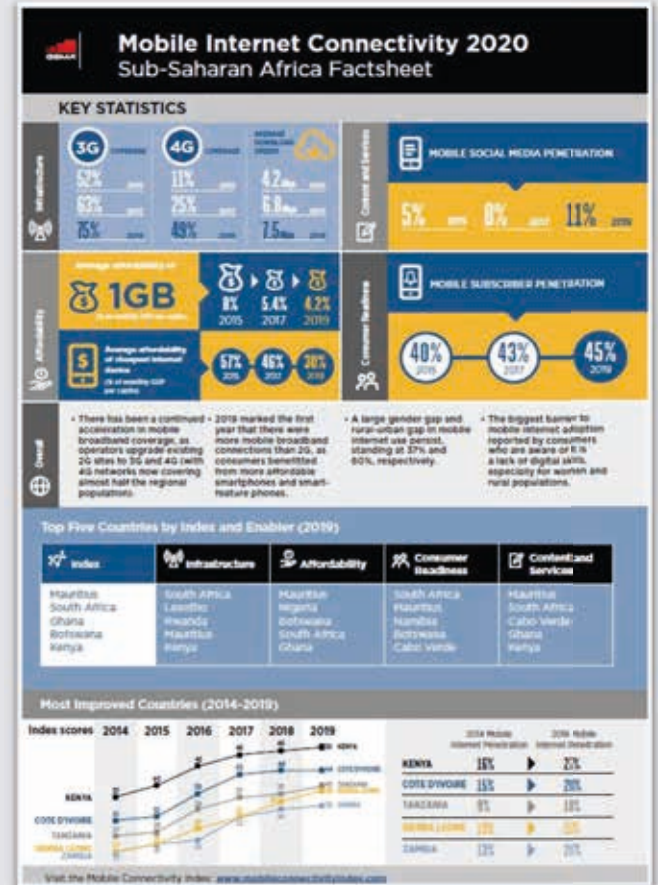
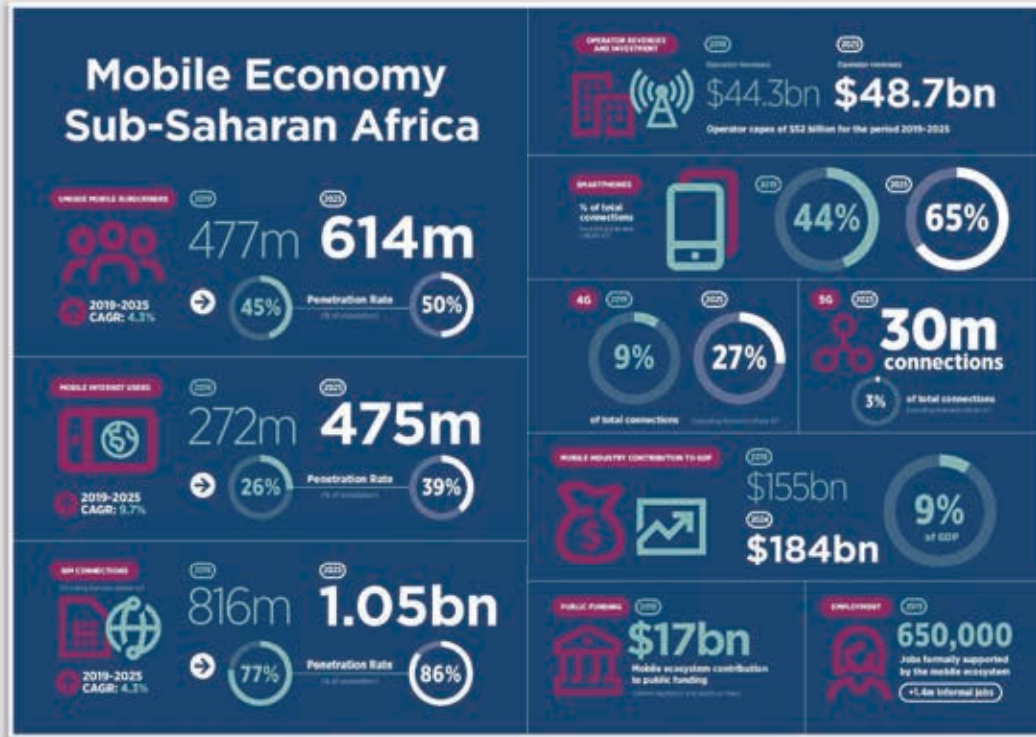


In Kenya, 83% of the population are online already compared to South Africa (56%) and Nigeria (60%). But Nigeria's internet population of 112 million means that more than one out of five African internet users are from that country.

World Regions	Population (2019 Est.)	Population % of World	Internet Users 30 June 2019
Africa	1,320,038,716	17.1 %	525,148,631
Asia	4,241,972,790	55.0 %	2,200,658,148
Europe	829,173,007	10.7 %	719,413,014
Latin America / Caribbean	658,345,826	8.5 %	447,495,130
Middle East	258,356,867	3.3 %	173,576,793
North America	366,496,802	4.7 %	327,568,628
Oceania / Australia	41,839,201	0.5 %	28,634,278
WORLD TOTAL	7,716,223,209	100.0 %	4,422,494,822



AFRICA THE MOBILE ECONOMY



LAST MILE INVESTMENT GROWING

Terrestrial Backbone Fibre

- Cape to Cairo race continues – Pandemic did not slow down the race.
- Increase in cross border and regionalized fibre infrastructure allowing countries choice of operator
- Deregulation of markets driving down high price points
- Far more mature policies in place for infrastructure build outs – but not in all countries

FTTx Investment

- Access infrastructure has been expanding and improving
- Pricing of fibre-based products has seen some reduction
- Economic improvements in some markets
- Government policy changes
- Access to relevant content

Satellite

- Starlink investment going to reshape African connectivity – Here's hoping it will be affordable enough?

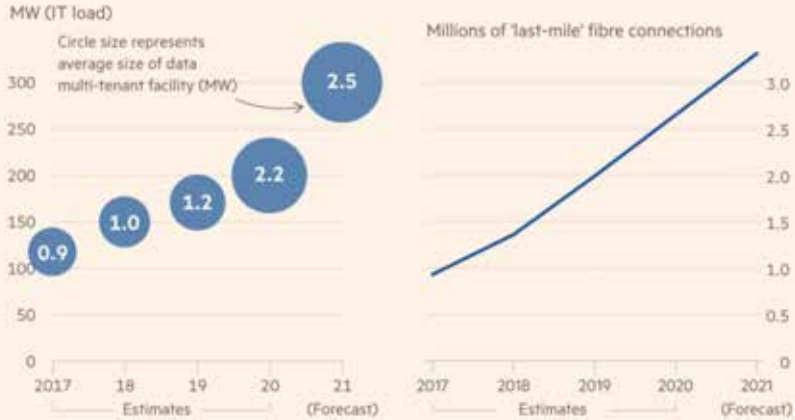
Spectrum

- Fight is on between operators to obtain utilized spectrum to support 5G rollout's
- Regulators grapple with Spectrum auctions



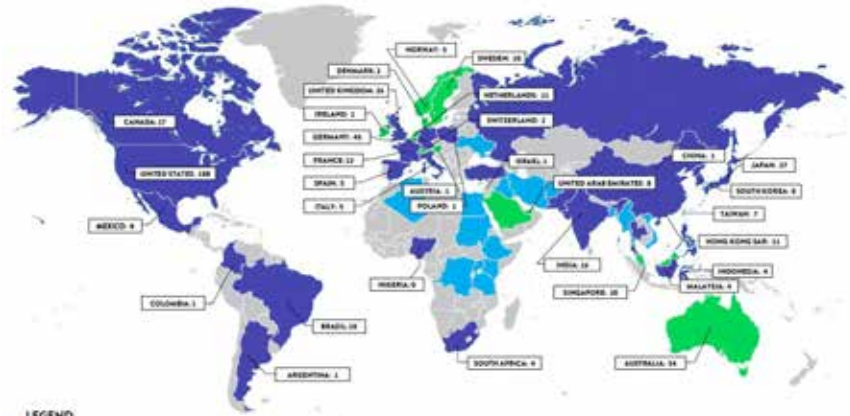
EXTENSIVE DATA CENTRE INVESMENT

African's growing data centre capacity



Source: Xalam Analytics
© FT

1. Globalization of Cloud is Driving Globalization of Data Centers



LEGEND

- Top 40 Countries by Population
- Top 40 Countries by GDP
- Top 40 Countries by both Population and GDP

Note: Figures represent # of Cloud On-Ramps per country
Source: The World Bank, Cloudscape.com, Cowen and Company

SUBSEA CABLE INVESTMENT

Equiano (2021)

- Connecting Portugal to South Africa
- 20x more capacity

2Africa (2024)

- 21 landings in 16 countries in Africa
- Capacity of up to 180Tbit/s on key parts of the system

African countries available directly from Teraco:

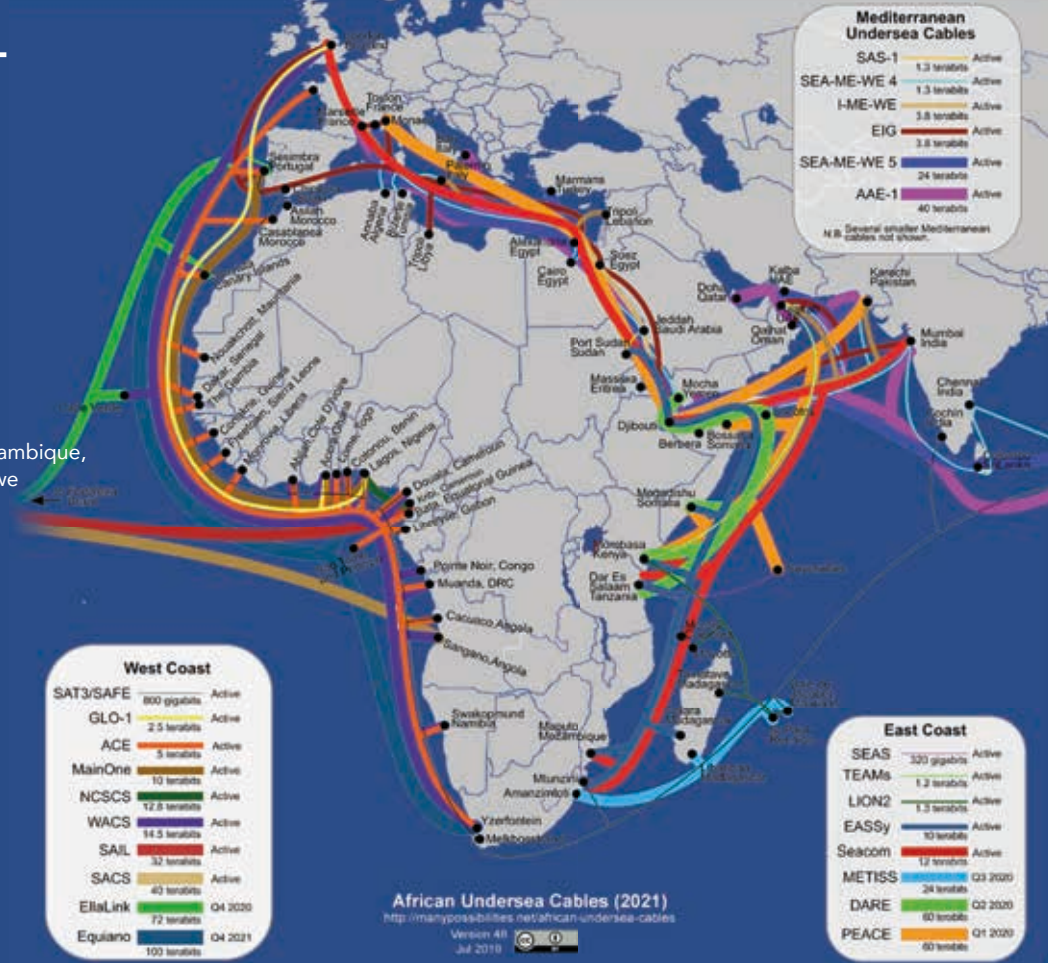
- Angola, Botswana, DRC, Lesotho, Madagascar, Mauritius, Malawi, Mozambique, Namibia, Réunion, Seychelles, South Africa, Swaziland, Zambia, Zimbabwe

Access via terrestrial cables from Teraco:

- Liquid Telecoms, Seacom, Telkom (Openserve), CMC Networks, WIOCC, Vodacom, MTN, Internet Solutions, Broadband Infracore

Access via subsea cables from Teraco:

- ACE (2020)
- METISS (2020)
- PEACE (2021)
- EASSy
- WACS
- SAT3 / SAFE
- Seacom
- SACS



WHY PUBLIC CLOUD INFRASTRUCTURE FOR SUB-SAHARAN AFRICA WILL BE IN SOUTH AFRICA

- Large, growing addressable market. Corporates moving into the cloud.
- Latency.
- Stable power infrastructure.*
- World class data centre infrastructure available.
- High availability of fiber and undersea cable connectivity.
- Favorable regulatory environment.
- Stable political climate.
- Stable economic climate.
- Geographic location (furthest point south from European hub).

JHB – CPT	= 16ms
JHB – London	= 159ms
JHB – Nairobi	= 51ms
JHB – Lagos	= 94ms
London – Nairobi	= 135ms
London – Lagos	= 98ms
CPT – London	= 144ms
CPT – Nairobi	= 66ms
CPT – Lagos	= 110ms

*Relative to sub-Saharan Africa.

THE ADVENT OF PUBLIC CLOUD INFRASTRUCTURE

Why are they here?

African Business May 2020

Top 250 Companies

Rank 2020	Rank 2019	Company Name	Country	Industry	Market Cap (US\$m)	Net income (US\$m)
1	NEW	Prosus	South Africa	Technology	119,141	n/a
2	1	Naspers	South Africa	Media	62,259	380
3	2	Financière Richemont	South Africa	Luxury Goods	28,000	149
4	3	Anglo American	South Africa	Metals & Mining	22,618	195
5	8	Anglo American Platinum	South Africa	Metals & Mining	13,048	1,019
6	4	Firstrand	South Africa	Finance	12,553	1,701
7	7	Vodacom Group	South Africa	Telecoms	12,483	817
8	10	Maroc Telecom	Morocco	Telecoms	11,082	266
9	5	Standard Bank Group	South Africa	Finance	10,122	1,450
10	14	Safaricom	Kenya	Telecoms	9,966	598
11	29	AngloGold Ashanti	South Africa	Metals & Mining	8,760	-7
12	9	South32	South Africa	Metals & Mining	8,355	389
13	15	Mondi	South Africa	Paper & Forest Products	7,679	880
14	11	Sanlam	South Africa	Insurance	7,119	394
15	17	Attijariwafa Bank	Morocco	Finance	6,993	568
16	13	Capitec Bank Holdings	South Africa	Finance	6,824	292
17	16	Kumba Iron Ore	South Africa	Metals & Mining	6,105	896
18	27	Commercial International Bank	Egypt	Finance	6,064	747
19	50	Gold Fields	South Africa	Metals & Mining	5,494	175
20	12	MTN Group	South Africa	Telecoms	5,334	494
21	19	Dangote Cement	Nigeria	Construction Materials	5,183	523
22	65	Sibanye-Stillwaters	South Africa	Metals & Mining	4,895	-244
23	NEW	MTN Nigeria	Nigeria	Telecoms	4,767	n/a
24	24	Bid Corp	South Africa	Retail	4,586	226
25	51	Impala Platinum Holdings	South Africa	Metals & Mining	4,566	81



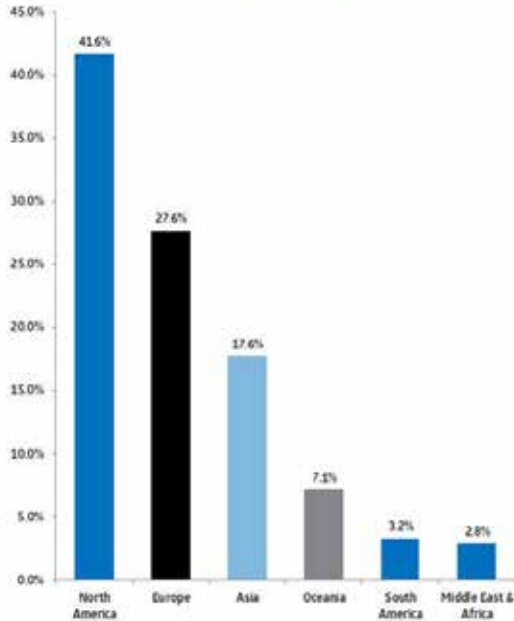
THE LATENCY DIFFERENCE: LOCAL REGIONS MAKING A DIFFERENCE

RTT (Round Trip Time) to resources deployed in the cloud from Teraco's Africa Cloud Exchange has improved from an average of 171ms down to **less than 2ms**.

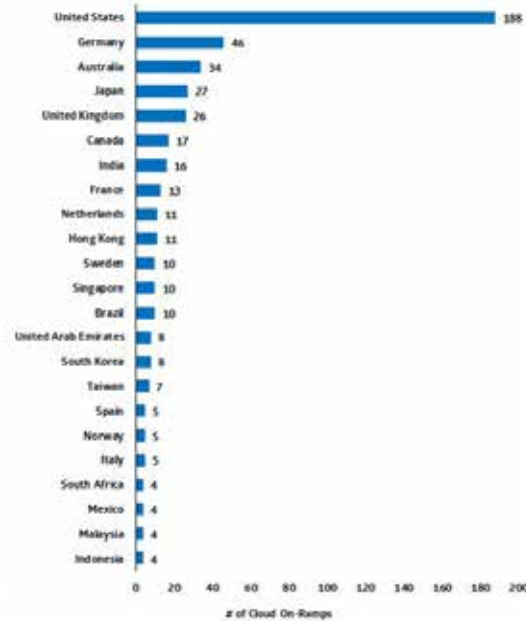


CLOUD EXCHANGES EMERGING

Market Share of Cloud On-Ramps By Region



Cloud On-Ramps by Country



NOTE: Cloudscene only lists cloud on-ramps for which the address is known, thus certain on-ramps are not captured
 Source: Cloudscene.com (December 2020), Cowen and Company

- Amazon and Microsoft first operators to invest in Cloud regions in Africa
- Incredible early adoption of Cloud Regions
- 48% Growth in 2020 on cloud connections in 2020 at Africa Cloud Exchange
- More Cloud Regions on the way



IXP's ARE UP AND TO THE RIGHT

- 46 active IXPs located in 42 cities in 34 countries
- 922 Active ASN's in the Southern Region
- Countries reviewing benefits of deregulation e.g. Ethiopia, Congo
- More Eyeballs.... As users now see internet access as a necessity rather than a nice to have, IXP's see huge traffic growth in 2020
- NAPAfrica Traffic Example:
 - Feb 2020 Traffic: 994.12Gbps
 - Feb 2021 Traffic: 1.63Tbps



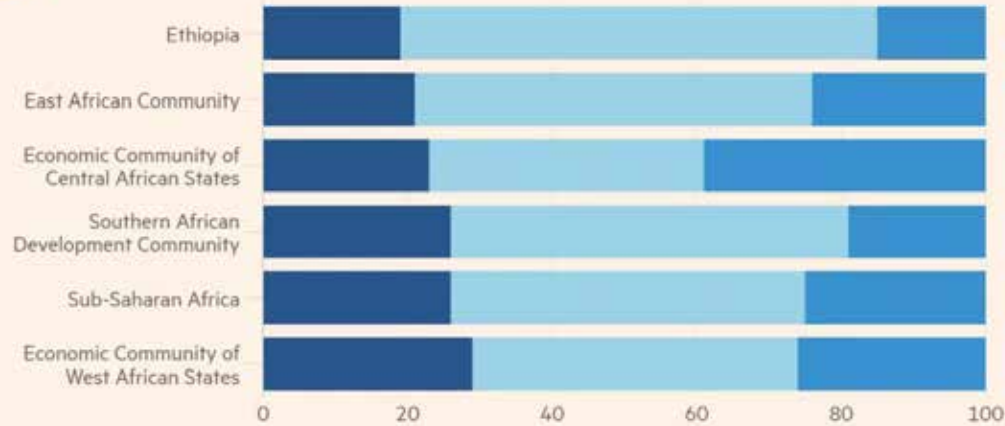
FORBES MAGAZINE: AFRICA IS THE NEXT FRONTIER FOR THE INTERNET

Still a lot of work to be done...

Africa's lack of internet connectivity is largely unrelated to infrastructure

% of population in countries/regions

■ Mobile internet subscribers ■ Covered but not using internet
■ Not covered



Source: GSMA
© FT



THANK YOU

michele@teraco.co.za
nap@teraco.co.za

The world **connects here.**

Teraco Data Environments (Pty) Ltd
5 Brewery Street, Isando, 1600
Phone +27 11 573 2800 / +27 (0) 86 083 7226

www.teraco.co.za

TERACO™
AFRICA'S DATA CENTRE