Inputs to STOA annual report

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What is your view on the deployment of FTTx in Africa?

The take-up of fixed broadband (FBB) in general and FTTx in particular has been lagging in Africa when compared to other regions. This is illustrated in the graph below which shows broadband penetration and share of FTTH connection over time.

Figure 1: Fixed broadband penetration and FTTx share of fixed broadband connections in NA (in percentage) [Source: Analysys Mason, Telegeography 2024]

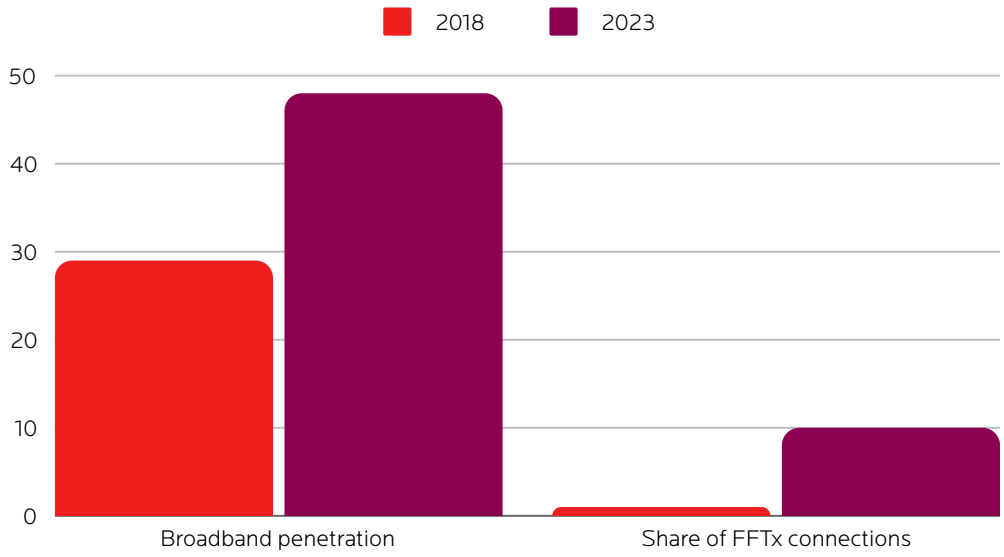
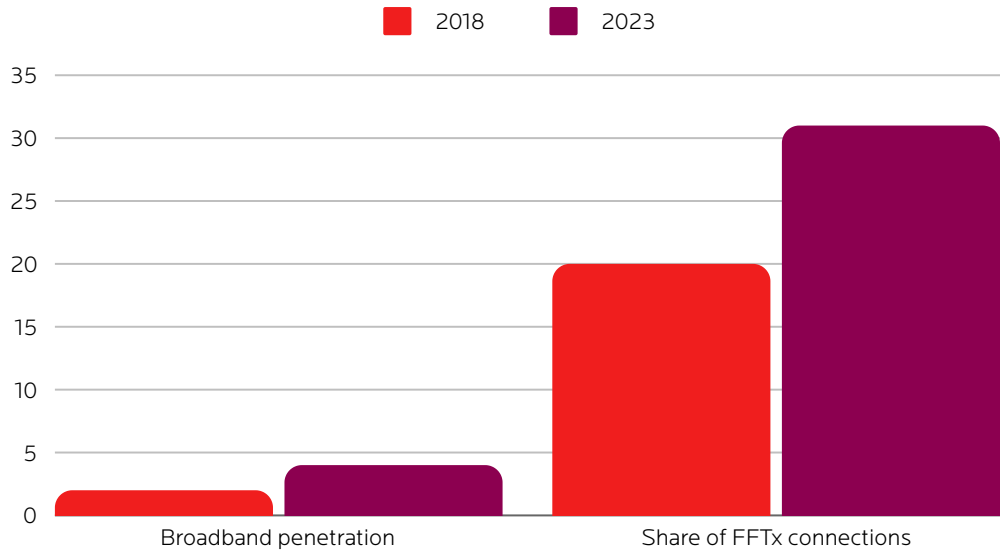


Figure 2: Fixed broadband penetration and FTTx share of fixed broadband connections in SSA (in percentage) [Source: Analysys Mason, Telegeography 2024]



The low development of FTTx in Africa was mainly due a lack of supply side measures by governments and regulators and more importantly a lack of investments in fixed infrastructure.

We however expect FBB infrastructure (i.e. coverage) and penetration to improve significantly going forward as governments' digital inclusion initiatives / fibre infrastructure programmes are being deployed and operators are focusing more on fibre deployment both on long haul and metro/access networks.

What are the key initiatives of telecom operators to decarbonize their power footprint in emerging markets?

In general, operators are more worried nowadays about power reliability than decarbonisation. This has made operators to think about and to start mainly using solar energy (on top of diesel generators) to cope with this challenge. Operators are also willing to carry out sustainability initiatives, such as carbon reduction, when there is a business case (i.e. cost reduction or no increase in costs) or due to a regulatory obligation.

According to GSMA, the telecom industry is responsible for ~3% of the global energy consumption, and energy costs represent between 15% and 40% of operators operating costs. Energy use is expected to continue increasing driven by more data-intensive applications, higher data consumption, higher power-consuming equipment and increase network densification (such as 5G rollout).

Analysys Mason has identified four different strategies used by operators for reducing energy related costs that operators are following and that have a positive impact on carbon emissions, as presented in the figure below.

Figure 2: Strategies related to energy reduction and examples of investment options [Source: Analysys Mason, 2024]

Strategy/ investment options	Description	Examples
Partnerships (long term)	Power Purchase Agreements (PPAs) are re long-term renewable energy contracts and are becoming more popular and allows for a hedging strategy against price fluctuations. Environmentally, this can support decoupling emissions from consumption, with the EU seeing PPAs as one of the pillars of a reformed electricity market.	Telia; Telstra; KPN; Meta; Microsoft
Energy production (medium term) – solar panels, wind turbines	Investing in localised energy production supports lower energy purchases. It can also offset the reliance on diesel generators in areas which have intermittent or unreliable grid access. The production of energy also provides an opportunity to sell excess energy into the system whenever favourable to do so.	Cellnex; Google; Phoenix Towers; Airtel Africa; MTN; Vodafone; Westfalen Wind-Group
Energy storage (medium term) – Li-ion and aluminium batteries	Localised energy storage allows actors to store purchased or produced energy when prices are low and utilise, or sell, when prices are high. Different battery technologies are available, but lithium-ion is currently the standard.	Google; China Telecom; MIT / Peking University (research project)
Operational efficiency (short term) – Heating / Cooling recycling, Smart chip management	Parallel deployment of multiple mobile generations and fixed networks significantly increases energy consumption, making sunsetting of legacy systems a key goal to reduce energy needs. Recycling of heat generated from data centres to be channelled into underground water systems running below cities and towns to create “eco-districts”. Other examples include optimisation of energy usage through AI/ML-powered automation. Using smart chip management, telecom networks can be more flexible and adjust equipment activity to network demand.	Stockholm Data Parks; Amazon; Interxion (data centres); Ericsson; Nokia; VodafoneZiggo

Datacenters have now landed in most emerging countries but remain rather small and underutilized. Do you see an explosion of uses coming?

The emergence of mobile broadband and the (albeit slow) fixed broadband networks development, has supported the development of cloud services for both B2B and B2B customers.

These applications are progressively driving the need of datacentre in the home country (or in nearby locations) in order to:

- store data nationally, for regulatory reasons (data protection laws);
- reduce latency in order to improve responsiveness of applications;
- cache content locally to improve quality (e.g. streaming) while reducing the reliance on international bandwidth.

Hyperscalers (such as Microsoft, Amazon, Google…) have only relatively recently entered in Africa, citing lack of political stability, lack of connectivity and reliable energy as the main reasons for holding back their investments initially. Various DC providers with different types of client focus are now present in Africa such as Equinix, Digital Realty, NTT, Vantage DC, Africa Data Centres and Wingu, just to name a few.

We expect DC demand to continue growing significantly in Africa to cope with enterprise, retail and hyperscale demand.

What are the latest prospects of rural communication penetration, to connect the unconnected?

According to the ITU, in 2023 around 80% of population used the internet in urban areas, in comparison to only 50% in rural areas. The Internet divide is therefore well present in emerging markets.

There is a variety of different technological solutions and initiatives for providing rural connectivity such as:

- Shared Rural Network: mobile initiatives such as the Shared Rural Network in the UK in which MNOs are coordinating to fill gaps and share sites in rural locations where there is some coverage but not complete coverage (where only one MNO is present);
- Wholesale mobile using low-cost sites and a mix of satellite and terrestrial backhaul: providing connectivity through the use of a simple and low cost of radio access network (RAN) often solar powered and use of satellite and TV White Space (TVWS) for backhauling. Examples include: · AMN in 15 African countries, iSAT Africa providing services to MTN in Uganda, Nuran Wireless providing services to Vodafone in Ghana, Vanu in many countries, Andesat in Peru, and Axess/Hispasat in Mexico;
- Wi-Fi hotspot: providing broadband access in a specific rural area and using satellite backhauling to connect to the internet backbone. Examples include ViaSat in Brazil and Mexico, Hughes/Stargo in Mexico, and Eutelsat in Africa;
- High-altitude platforms (HAPS) and other aerial technologies: connectivity is provided between an antenna mounted on a HAPS, such as an unmanned aerial vehicle (UAV) or guidable balloon, and a mobile handheld device. These technologies are generally still in the development phase, with ongoing initiatives attempting to make the approach commercially viable;

- Satellite (in particular LEO): the launch of new LEO constellations is allowing to provide additional broadband capacity in rural areas and driving prices downwards which increases affordability. Examples include Starlink and OneWeb;
- D2D (Device to Device): providing connectivity (currently emergency services and SMS with plans to expand to voice and data) in uncovered areas through mobile phones. This is an emerging solution which includes two different strategies / technology paths either by using mobile existing spectrum or by using spectrum that is assigned to mobile satellite services (MSS). Existing players include Skylo and Apple Globalstar and other players looking to enter the market include AST SpaceMobile, Lynk, Starlink, Viasat/Inmarsat, Iridium, and Omnispace.

What is your view on the roll out of 5G in emerging markets?

5G momentum continues to grow around the world as 5G is expected to benefit all economic sectors of the global economy. According to GSMA, 5G will overtake 4G this decade in terms of adoption to become the dominant mobile technology worldwide.

When looking at 5G rollout in emerging markets, we note that for example only 40% of countries have launched 5G in MENA and around 30% in Sub-Saharan Africa. In countries that have done so, 5G subscribers still represent typically much less than 20% of mobile subscribers.

The rollout (and adoption) of 5G has therefore been very slow. However, we expect operators to accelerate the rollout of 5G networks and to progressively catch up with developed markets (catching up may take time as the rollout gap may first widen in the short term, until development plateaus in developed markets after which developing markets will then start to slowly catch-up). This will be driven by:

- governments and national regulatory initiatives (award of new frequencies, enforcement of technology neutrality measures);
- subsidised rollout in some markets (e.g. by government, World Bank, public-private partnerships etc.);
- operator direct investment to improve their QoS and expend their mobile coverage;
- need of new technologies such as 5G to economically cope with data usage increase and the rapid growth of streaming and cloud services.