chapter 10
Towers

Matthew Edwards,
product director, TowerXchange

The rocky road ahead for towercos in Africa

The African cellular network industry is facing tough times but remains resilient. Currency devaluation in Nigeria has caused consumers to tighten their belts while investment costs have increased precipitously. Investment in South Africa is shifting from network expansion to network resilience as blackouts and vandalism threaten the performance of Africa's most advanced telecom network. Networks are continuing to expand in East and Central Africa where growth in sites and technology upgrades have been more robust, but the industry is facing one of the toughest winters in years. What does the road to recovery look like?

How towercos work

Towercos own and operate telecom masts on behalf of mobile network operators (MNOs). By separating passive infrastructure from the active mobile network, towercos are enabling mobile subscribers in SSA to grow from 515 million in 2021 to 613 million in 2025 by freeing up capital, bringing fresh investment into passive infrastructure, and enhancing network efficiency and performance. But with market conditions so tough, how can networks continue to reach new customers? Towercos can play a key role in supporting the expansion of telco networks despite tough macro environments.

The traditional lease between towercos and MNOs includes several features that guarantee mobile operators' consistency of service and towercos consistency of returns. A large proportion of towerco returns are priced or paid for in hard currency which enables them to offset devaluation risk and continue to purchase oil, batteries, and steel on international markets. Mobile operators also rarely default which means towercos work with some of the most credit worthy companies in Africa. Low default risk and hard currency earnings enable access to capital more cheaply than other firms on the continent.

Africa has had a turbulent year politically, with coups and instability plaguing many countries.

However, no new regime has been stupid enough to attack the mobile networks on which their citizens rely. Telecom towers are largely safe, even in warzones, and that further enables towercos to invest with confidence. Alongside all this you also have robust growth in population and economic prosperity, accelerating demand for voice and data services that drives revenue in the telecom tower sector. These protections are no panacea but they position towercos as important partners in network development in Africa.

State of the market

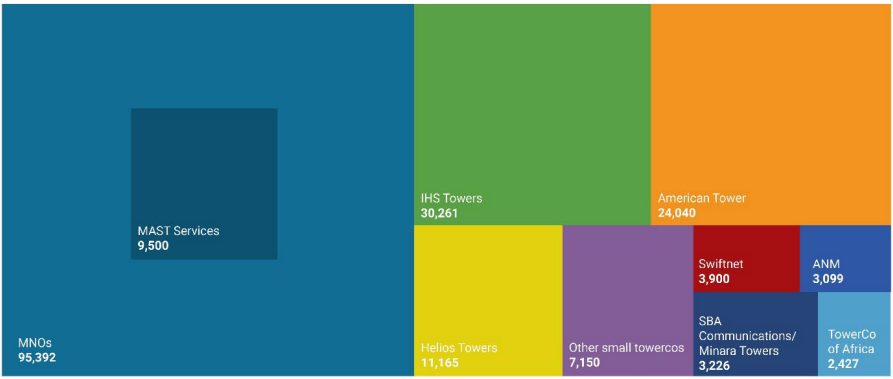
Africa's telecom tower industry has long been one of the most robust in the world. Since the early 2010s there have been independent towercos across the continent, and networks are weathering the current storm so well thanks to the injection of outside capital and improvements in network management. In sub-Saharan Africa, TowerXchange tracks 96,672 telecom towers owned by the continent's various towercos (out of 183,064 total towers in sub-Saharan Africa).

The newest towerco to be formed in Africa is MAST Services in South Africa, which will take 9,000 towers off Vodacom's balance sheet and manage them independently. The creation of Vodacom's own towerco is part of a wider global trend which has seen MNOs form their own towercos; Vodafone, Deutsche Telekom and Axiata have all created their own captive towercos and then sought to sell part, or all, of the new entity. In Africa most towers are now owned by towercos, and it is towercos that must confront the double challenge of high energy costs and expensive capital.

Meeting the challenges

Energy remains the industry's number one challenge. In South Africa grid quality has declined, leading to loadshedding – planned blackouts – of up to 8 hours a day. Those long gaps in service mean that cell towers need to be powered by large banks of batteries or diesel generators. In South Africa mobile networks have slowed 5G rollouts and cancelled coverage expansion plans to invest in energy infrastructure with their towerco partners. Vandalism and theft are on the rise too, which makes the investment case more challenging. This brings South Africa

Breakdown of ownership of Africa's 183,064 telecom towers (Q3 2023)



Source: TowerXchange

into alignment with the rest of Africa where mobile networks have expanded much more quickly than the electricity grid.

At the same time that grid reliability is failing and electricity costs are rising, technology upgrades and new co-locations are pushing up site loads. 4G densification and early 5G deployments in major urban areas across Africa are pushing up the energy demands of sites. Consumers want reliable data and towercos are responding by installing new diesel generators, battery banks and solar and wind deployments. In Africa, towercos have developed a unique expertise in energy management, delivering power-as-a-service to their customers, a service now critical to meeting customer needs. Innovation continues as towercos experiment with power purchase agreements and new technologies like super-capacitors, biofuels, or fuel cells.

Energy is key not only to lowering costs and improving resiliency, but also to meet the industry's ambitious carbon reduction targets. Africa is at the forefront of the climate crisis and both MNOs and investors are pushing ESG higher up the priority list. In response, major towercos have set out their own carbon-reduction roadmaps with 100s of millions of dollars committed to reducing emissions and divesting away from diesel and towards clean energy solutions. But carbon reduction is no easy task when demand for infrastructure is growing, capital is limited, and hard currency is in short supply.

Across the continent

Looking at three of Africa's other major telecom markets will paint a picture of a continent.

In Nigeria the Naira has declined from an official rate of 460 to the dollar in April 2023 down to a parallel market rate of 1,000 per dollar in October 2023. That pushes up the costs of imports like fuel, steel, and telecom equipment for those that bill in Naira like the country's mobile operators. A gigabyte of data has reduced in price from N1200 in November 2019 to N350 in October 2022. That pressure on costs domestically and internationally is making it difficult to operate.

Nigeria is the largest tower market in Africa with just under 40,000 towers, largely managed by towercos without an electricity grid to rely on. Hundreds of millions of liters of diesel are burned each year to keep this network running, and towercos like IHS Towers and American Tower have been active in trying to replace that fossil fuel with solar power and energy storage solutions to keep cell towers active 99.9% (or more!) of the time.

In amongst all this activity, comes the news that MTN will be awarding 2,500 sites to American Tower which used to be managed by IHS Towers. Competition remains fierce between towercos and many of these new sites will need building from scratch. This means new sites will still be added in Nigeria to tackle its huge infrastructure deficit, but this growth is expected to slow while the economy adjusts to the new exchange rate and consumers face higher prices.

In the DRC we have seen an increasingly competitive market develop too. Helios Towers's 2,233 sites have been joined by Eastcastle Infrastructure, which has more than 1,000 sites active or under construction. The Madagascan AXIAN Telecom-backed TowerCo of Africa has entered the market too and is finalising its licence. While AMN, a rural specialist, has 517 sites live serving ultra-rural communities.

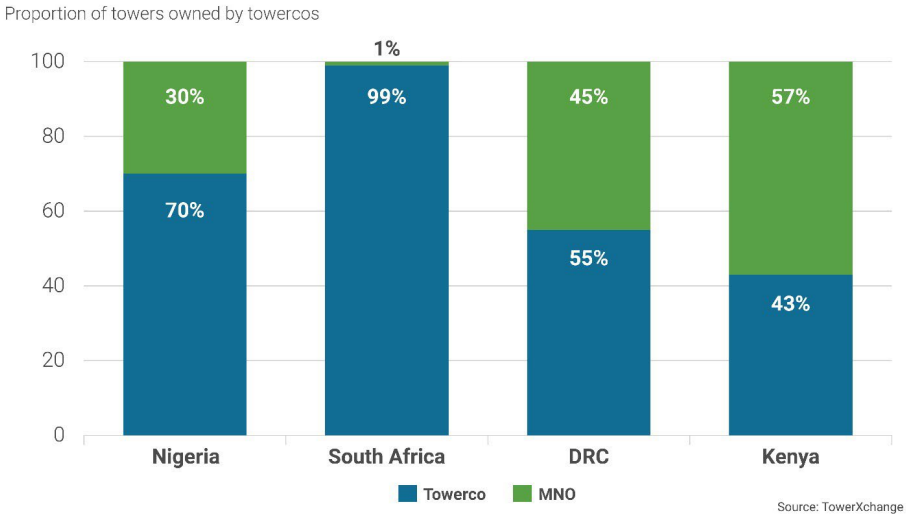
While Nigeria faces tough economic challenges, in the DRC we see public companies, entrepreneurs and innovators rushing to invest

private capital into African infrastructure. The DRC is the largest country by landmass in SSA, but less than half the population have cell phones, and for those that do service quality is poor. Each telecom tower has to serve an average of 6,500 SIMs, or about four times the load in the developed world. Four strong MNOs (Orange, Vodacom, Airtel and Africell) compete for customers backed by internationally supported towercos. The road is long, but progress is being made.

In one of Africa's most dynamic economies we see strong network growth under pinned by towercos. Kenya is lucky to enjoy a good grid which means towercos can focus on back-up power rather than spending significant sums on providing primary power with diesel generators. This reduces the capital required per site and enables a faster network rollout. Safaricom and Airtel are supported by three good towers to rollout 4G and kick-start 5G in high density areas.

American Tower have been active in Kenya since 2018, but independent towercos Alan Dick & Co and Atlas Tower have been building too adding 100s of sites a quarter between them. A reliable grid and high technology adoption has also helped drive advancements in network design. Street furniture such as small cells and distributed antenna systems (DAS), as well as inbuilding solutions is accelerating the development of a dense network ready to support high capacity 5G.

The inflationary recovery after the disruption of COVID-19 lockdowns could have toppled Africa's telecom sector. However, despite massive supply chain disruption, explosive energy costs and rising costs of capital we have seen relative peace and continued growth, albeit at a slower pace. Some markets remain strong and will continue to grow while others are consolidating. Some markets like South Africa and Nigeria may need a year or more to bounce back to growth, but across the continent we're seeing telecom tower companies invest and expand to underpin the growth of Africa's economies. ■



Alessandro Ravagnolo,
partner, Analysys Mason

Alex Pericleous,
principal, Analysys Mason

In-house energy service companies: the best of all possible worlds

The physical components found within a mobile site can be conveniently categorised into three main groups: active, passive and energy-related.

The active part of the network is typically owned directly by mobile network operators (MNOs). Conversely, the ownership and responsibility for passive infrastructure and energy-related equipment (both of which can more readily be shared between co-locating MNOs) has progressively shifted towards third-party tower companies (towercos). In emerging markets, where power management is complicated by the absence of widespread and dependable electricity grids, most of the tower sale and lease-back (SLB) arrangements have encompassed both passive and energy components.

Putting aside financial and deleveraging considerations, MNOs are progressively demonstrating a greater inclination towards outsourcing power management (and associated equipment). This preference could be attributed to the intricate nature of power supply and management, which is more remote to existing MNO skillsets than passive asset management, and necessitates different monitoring systems and dedicated resources especially when power is self-generated, is shared between multiple consumers (that is, different co-located MNOs) or is the target of cost and usage reductions.

In recent years, specialised energy service companies (ESCOs) have been established and expanded in emerging markets, particularly in Africa. These entities dedicate themselves solely to supplying power and overseeing power equipment and the associated operations and maintenance (O&M) duties, without getting involved in passive infrastructure. Notable ESCOs include Aktivco, Applied Solar Technologies, Biswal, Distributed Power Africa, Energy Vision, ESCOTEL, GreenWish Partners, IPT Powertech and Voltalia.

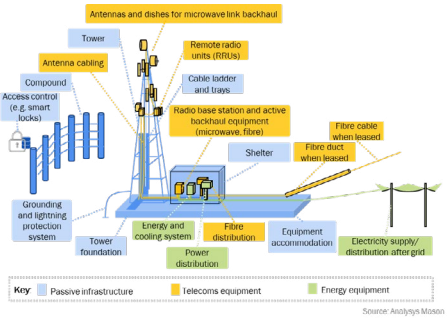
As the use of ESCOs gains traction, there can be an interplay between towercos and ESCOs. Central to these discussions is the optimal approach to delivering power as a service (PaaS): either through a unified towerco–ESCO entity (T-ESCO) or as an independent energy service company (I-ESCO) (Figure 2).

Towercos perceive power management as an integral facet of their growth strategy

Towercos should include PaaS in their operational scope for three reasons.

Experience and familiarity. Much of the complexity associated with running a towerco in emerging markets originates from the management

Mobile site components



visibility • insights • action

from field to boardroom

- REDUCE ENERGY COST AND CO_2
- OPTIMISE CAPITAL EXPENDITURE
- REDUCE MAINTENANCE COST
- INCREASE REVENUE / REDUCE RISK

www.powerx.ai

of power equipment. This includes refuelling, uptime monitoring, maintenance, security, and end-of-life equipment replacement. Given the historical context of SLB deals, towercos have amassed significant expertise in this space. This service is incremental to the passive infrastructure sharing and towercos see it as increasing the value they provide to their MNO clients.

Organic growth avenue. PaaS is seen as an important route to organic growth for towercos. Energy is a significant cost for MNOs; it accounts for approximately 15% of network opex. As these networks expand, increasing coverage and undergoing technological upgrades, energy demand will grow. This is especially challenging in countries where power infrastructure is limited and energy is scarce. towercos can seize the opportunity to leverage mobile network operator investments as well as make their own investments to meet the escalating demand. Several MNOs and towercos have already committed substantial capital to upgrade their power infrastructure.

Operational and commercial synergies. The integration of PaaS offers a confluence of operational and commercial synergies. Operationally, it enables the integration of network operations centre (NOC) monitoring, site visits, supplier management and asset oversight. From a commercial standpoint, towercos can present themselves as comprehensive solution providers, catering to various aspects of MNOs' needs.

These arguments form a compelling case for African towercos seeking to develop their own PaaS offerings.

Power business models at telecoms tower sites

	Electricity sourcing (including self-generation)	Power asset ownership	Power O&M	Electricity consumption
Vertically-integrated MNO	MNO	MNO	MNO	MNO
Towerco Pass-Through (Towerco)	MNO	Towerco	Towerco	MNO
Towerco ESCO (T-ESCO)	T-ESCO	T-ESCO	T-ESCO	MNO
Independent ESCO (I-ESCO)	I-ESCO	Towerco / MNO / I-ESCO	I-ESCO	MNO

Financial markets may incentivise the segregation of PaaS from tower co-location services

Institutional investors and towerco executives may have different views. Towercos in emerging markets have consistently been undervalued by public markets relative to their counterparts in developed regions (Figure 3).

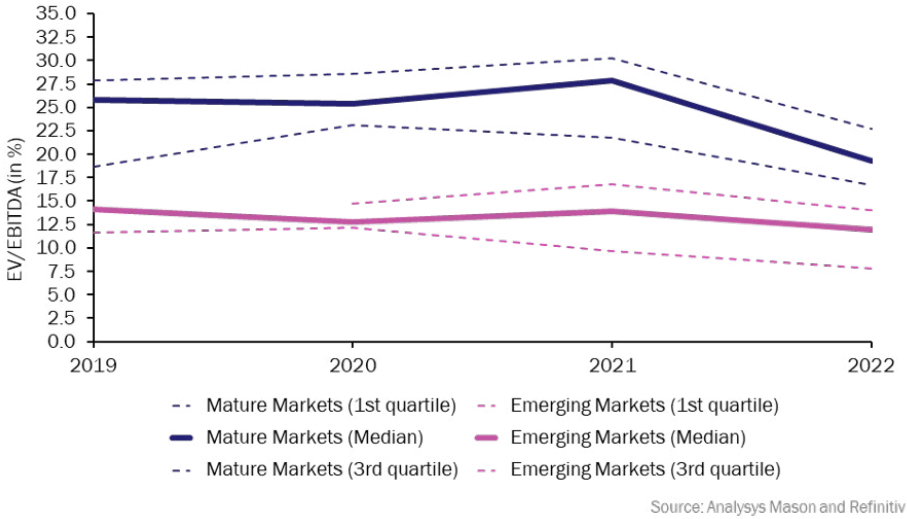
Discussions with investors have identified several factors beyond country risk premium that may be contributing to the lower trading multiples of emerging market towercos. Exposure to power emerges as a key factor. PaaS is not universally perceived as an infrastructure-grade investment due to the susceptibility to energy cost fluctuations, shorter contract durations, heightened operational risks, abbreviated equipment lifespan, and elevated refresh capital expenditure and operating costs.

In essence, infrastructure investors associate greater risk with PaaS when contrasted with tower colocation. As a result, they may not be willing to attribute the same valuation multiples to this part of the business. Consequently, some investors gravitate toward towercos that emphasise PaaS to a lesser extent.

Could the establishment of captive ESCOs offer a solution?

Towercos that offer power-related services to MNOs (that is, T-ESCOs) should contemplate segregating their PaaS operations into distinct entities while retaining operational and financial control, effectively creating captive ESCOs. This strategic move entails straightforward financial benefits. T-ESCOs can clearly explain the relative revenue and margin contributions of both services (colocation and energy), aiming for enhanced valuation.

Additionally, this approach may attract minority investors experienced in energy-related ventures. The



Towercos EV/EBITDA

Note: Mature market towercos: American Tower, Crown Castle, Cellnex Telecom, Inwit, Rai Way, SBA Communications Corp, Vantage Towers. Emerging market towercos: GTL Infrastructure, Helios Towers, IHS Holding, Indus Towers, PT Dayamitra Telekomunikasi, Tower Bersama Infrastructure.

captive nature of the newly formed ESCO would still enable T-ESCOs to capitalise on the strategic and operational advantages of offering both services seamlessly. Transparency regarding pricing allocation between the two business units could yield long-term benefits, including better risk management, enhanced operational accountability and improved relationship with MNOs. Moreover, potential strategic benefits abound, such as expanding PaaS offerings beyond the existing portfolio of owned sites (including MNO-owned sites and smaller towercos lacking this capability), fostering experimentation and innovation, and ultimately out-competing I-ESCOs.

However, the complexity in successfully delivering this captive ESCO should not be underestimated, as T-ESCOs must ensure that the two distinct entities have the appropriate incentives to drive both cost (for example, maintenance and supplier management) and revenue synergies (for example, commercial negotiations).

In some cases, re-negotiation of master service agreements with tenants might be necessary, as these agreements may not currently consistently differentiate commercial terms for energy and site colocation.

Conclusion

Towercos should consider the separation of their ESCO business into dedicated special-purpose vehicles to maximise value creation and visibility on returns on investments of the whole company for their shareholders. This is especially true for towercos operating in emerging markets, but there are merits in considering this option in developed markets as well. Management should not underestimate the cultural and implementation complexity of such strategy and must clearly identify the rules of engagement between the ESCO and the towerco entities through a master service agreement that ensures a full alignment of interests between the business units. ■

The changing face of Africa's tower market

An exert from Mordor Intelligence's Africa Telecom Towers and Allied Market size and share analysis – growth trends & forecasts (2023-2028)

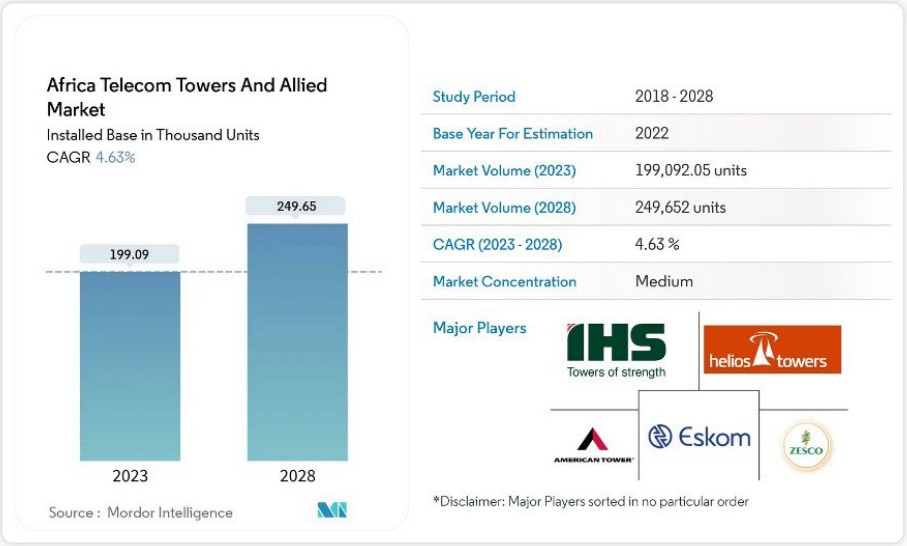
The telecom tower industry has drastically evolved over the past decade. The core towerco proposition and business models have been successfully adapted to match the demands of new markets in Africa. Many towercos are anticipated to hunker down in their core building business over 2023-2028, buying and leasing vertical real estate, and such towercos may still see plenty of 5G antenna overlaid onto their towers.

The Africa telecom towers and allied market size in terms of installed base is expected to grow from 199,092 units in 2023 to 249,652 units by 2028, at a compound annual growth rate (CAGR) of 4.63% during the 2023-2028 forecast period.

With the outbreak of COVID-19, the telecom industry has witnessed a significant increase in demand for internet services due to a major chunk of the population staying at home and remote working conditions. This has led to an expansion in demand for downloading, online video viewing, and communication through video conferencing, all of which are leading to increased network traffic and data usage.

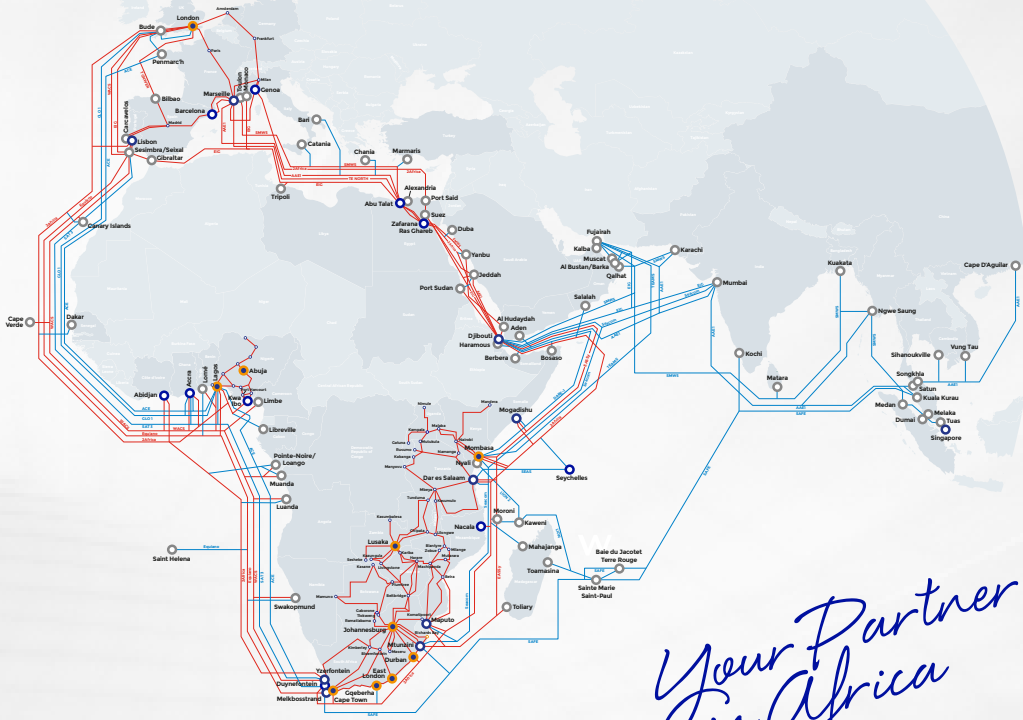
Several initiatives by telecom operators and other organizations, especially in low and middle-income countries, are expected to spur growth in the rural areas as the residents of these areas gain increased access to internet connectivity. Furthermore, with businesses going mobile and adopting new concepts like BYOD to increase employee interaction and ease of use, it has become essential to provide a high-speed and quality network.

The organizations have been looking



WIOCC

Africa's Digital Backbone



Your Partner in Africa

Africa's Carriers' Carrier

Delivering the digital backbones for leading cloud operators, carriers, ISPs and MNOs across Africa.

Connecting in excess of 1,000 locations in 30 countries in Africa and many more across the rest of the world.

- Global Connectivity
- Metro Connect
- IP Transit
- Colocation

forward to adopting BYOD aggressively in their operations, fuelling the market growth over 2023-2028. Moreover, development in cloud-based services for mobile users and the roll-out of 4G LTE services worldwide have increased the investment into networks by carriers, which drives the demand for telecom towers.

The increasing emphasis on improving internet connectivity to rural areas is one of the major factors stimulating the deployment and improvisation of the telecom infrastructure in these areas, thereby aiding the market's growth. Smartphone penetration, raising awareness, increasing penetration of digital technologies, and investments from several organizations and governments have been increasing the adoption of internet connections in the region.

The emergence of the KaiOS operating system and its partnerships with operators across Africa is helping overcome the affordability barrier for low-income users. The free resources offered, such as the 'Life' app, also help new users develop digital skills and understand how the internet can be relevant. Such initiatives are expected to boost internet penetration in these countries significantly.

Market developments

The African telecom and allied market is moderately competitive and has many global and regional players which account for a considerable market share and focus on expanding their client base globally.

Some of the major players in the market are IHS Towers (IHS Holdings Ltd), Helios Towers PLC, American Tower Corporation, Eskom Holdings Limited, etc. These players focus on research and development activities, strategic alliances, agreements, and other organic & inorganic growth strategies to stay in the market landscape over the forecast period.

In October 2022, American Tower's African business unit ATC Africa signed a multi-year, multi-product agreement with Airtel Africa. As part of the agreement, Airtel Africa would use ATC's communications sites across Kenya, Niger, Nigeria, and Uganda to support Airtel's network rollout.

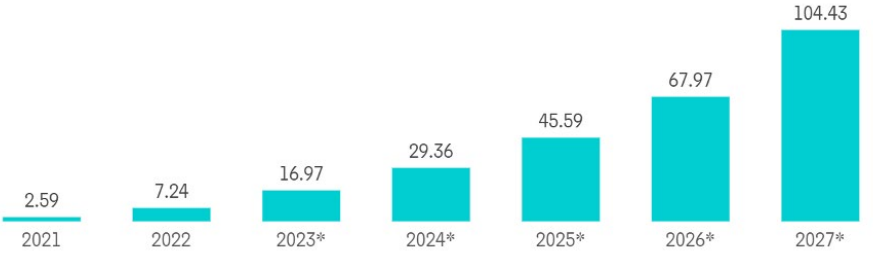
In February 2023, ZESCO Limited launched a refreshed core ideology and a US$6 billion projected investment across the utility's value chain of generation, transmission, distribution, and supply. The company always aims to increase its customer base. The company uses reflective market fees for all new electricity connections to provide its customers with an effective and efficient service. The connection fees have not been increased or changed but are market-driven. The company is taking up more projects to expand its regional presence.

In March 2023, Helios partnered with mobile network operators in South Africa to provide power-as-a-service to its sites due to the country's ongoing power crisis, Helios owns and maintains over 13,500 telecom tower sites in eight African nations.

Also in March, Axian Telecom announced a deal to upgrade its network in the Madagascan unit Telma with Ericsson. Ericsson announced that the solutions would provide Madagascar with faster and more reliable mobile services nationwide, reducing energy consumption and enhancing the 5G ecosystem.

Later in April 2023, Egbin Power PLC announced the construction of its Power Station in Lagos, Nigeria, with a 1,900MW gas-fuelled power plant. The project is now undergoing permitting. It will be built in a single step. The project's development is anticipated to begin in 2024, with commercial operations beginning in 2025.

Estimated Number of 5G Mobile Subscriptions, in Millions, Sub-Saharan Africa, 2021-2027



Source: Ericsson

Privately-owned towers to register significant growth

Privately-owned towercos own passive infrastructure on a site and lease space to MNOs to host their active equipment. They can either be pure-play independent towercos with no residual equity retained by an MNO or have a minority stake held by an MNO.

Countries like Nigeria have witnessed substantial tower infrastructure growth over the past few years. Towercos have gained significant traction due to their extensive portfolio of telecom towers which helped telecom operators and MNOs to roll out services in record time. In addition, MNOs in the country have indulged in outsourcing various telecommunications infrastructure needs to independent telecom tower providers, positively impacting the segment's growth in the region. Market vendors like IHS buy mobile towers from telecom companies or MNOs, build them themselves, and then lease them back to the operators. The company now operates in Cameroon, Côte d'Ivoire, Rwanda, and Zambia.

As MNOs seek to drive capital and operational efficiency and divest their tower portfolios to focus on their core business, the privately owned telecom tower segment is expected to gain significant traction in the coming years. Greater outsourcing to independent towercos could release a significant amount of capital which MNOs can reinvest in their networks to improve network coverage and accelerate 5G rollouts in Africa in the coming years. For instance, Helios Towers plans to build 1,000 telecom towers in South Africa to fuel the growth of 5G. The company has negotiated with local players and wants to buy existing cell towers from wireless carriers like Vodacom and MTN.

According to the survey from Ericsson, the 5G mobile subscription size is anticipated to cross 104 million by 2027 in the sub-Saharan Africa region. Such projected growth in 5G mobile subscriptions signifies a considerable demand for 5G infrastructure. Thus, the privately owned telecom tower segment will hold a significant share in the African telecom tower market in the coming years, owing to the increasing demand from MNOs to rollout their network in African countries and the growing acquisition of telecom towers by privately-owned telecom tower companies in the region.

South Africa to dominate the market

Rural mobile connectivity is becoming vital in South Africa, helping to bridge the digital divide and providing access to information, communication, and services to people living in remote areas. A growing number of telecom tower companies are expanding their infrastructure in rural areas and gaining substantial investments. This is expected to drive the telecom tower market in the country during the forecast period.

For instance, in March 2023, Infra Impact Investment Managers helped its portfolio company, Eagle Towers, secure a ZAR 100 million secured loan facility to support growth and expansion plans. The loan facility will help Eagle Towers drive increased telecommunication coverage and reduce access costs in South Africa. Eagle Towers builds, operates, and maintains telecom towers across South Africa, especially in rural areas.

New vendors are entering the market and acquiring 4G spectrum to expand network coverage across South Africa. In May 2023, Rain entered the mobile market for the first time, providing high-definition voice calls, SMS, data, and national 4G mobile coverage through its infrastructure. After acquiring spectrum in the 2022 auction, the operator overlayed its existing 4G network with a new layer that provides for more comprehensive reach.

Mobile network operators have made significant progress in rolling out 5G services, positively impacting market growth. In October 2022, Telkom launched its 5G high-speed internet network using Huawei Technologies. The telco wants to boost its fast-growing mobile data and fixed-line broadband businesses amid increasing broadband demand.

Moreover, the country's government efforts to boost broadband adoption are driving telecom tower demand during the forecast period. The South African government plans to turn off 2G and 3G networks by March 2025 to free up spectrum for 5G and 4G services. This is expected to make the country an attractive market for telecom tower companies in the coming years owing to the growth in 4G network coverage, increasing demand from rural areas for telecom towers, and faster 5G rollouts by market vendors. ■

Consumers with a 5G Smartphone, in Percentage (%), in South Africa, 2022

Source: Ericsson

Ani Chiuzan,
chief marketing officer, PowerX

We have seen continued growth across the African markets in consumer demand for telecoms coverage (both geographically and in bandwidth) which in turn fuels the necessity for reliable service, new tower sites and infrastructure ready for 4G and 5G upgrades.

The pressure on MNOs and TowerCos to increase CAPEX and reduce OPEX has never been greater.

For MNOs, this comes at a time when the end-user market is increasingly competitive. Although the number of mobile subscribers in Africa has continued to rise, ARPU is in a six-year downward trend - with consumers demanding more services in return for less per capita expenditure.

For TowerCos, this brings additional pressure. They are asked by their MNO customers to provide BTS growth at competitive prices in spite of poor grid infrastructure that keeps the cost of uptime SLAs high. The competitive TowerCo market across Africa is driving up the need for more value for money across all services - PaaS, NaaS and fibre.

The combined squeeze on income per capita and stress on CAPEX has required MNOs and TowerCos to address the operational efficiency of passive tower infrastructures. As well as seeking efficiencies to drive down OPEX, operators are committed to substantial reductions in their GHG emissions, commitments which are passed through the ecosystem to TowerCos, operations and maintenance service providers, OEMs, technology providers alike. This is particularly resonant in Africa where dependable grid power continues to be elusive, and there is an overreliance on energy generation on sites from alternative sources such as renewables or on-site diesel generators. Leading TowerCos in the region that have been operating renewable energy infrastructure for the last 10+ years have publicly shared that commercial models indicate energy generation from solar on site is becoming more cost-efficient than connecting to grid.

With the pressure to better manage tighter CAPEX and OPEX budgets, we see heightened focus on the key role digitization plays in facilitating growth. We have seen varying levels of investments in data acquisition from the large volumes of geographically dispersed passive infrastructure assets. The technology exists that enables access to data – IoT, sensors, site connectivity. The real revolution now comes from connecting the data across the organisation.

For PowerX, these challenges have accelerated adoption of our solutions at scale as a critical enabler to efficiently manage energy consumption, operations, and maintenance costs, enable resilient revenue growth and optimise capital expenditure.

PowerX is the first platform that combines data science, ML/AI with automated workflows integrated into business processes to improve efficiency, resilience, and sustainability at tower sites. By analysing data which already exists within a tower network infrastructure, our data intelligence platform scrutinises vast quantities of previously unused information - providing insights into undetected anomalies, trends, and opportunities for improvement. These translate into actionable optimisations to a network's performance, which when integrated into business processes, can optimize, provide comprehensive, real-time visibility,

across the organization, into every aspect of a network operation that achieved and/or can achieve further efficiencies. For a typical user, efficiency gains lead to reductions in on-site fuel consumption of 30%, 10-30% less CO2 emissions, 20% energy cost reduction and 30% less generator run-time.

The African market is unique when it comes to powering the hyper-growth in mobile connectivity for the next generations: despite its significant challenges with power infrastructure, the region is leading the way when it comes to adoption of hybrid power and PaaS business models.

For the African market however, there are additional challenges. Much of the difficulty and expense in power and asset maintaining/servicing for remote sites is in the unpredictability of events that require intervention. MNOs and TowerCos are often reacting to unforeseen (but not necessarily unexpected) problems: a malfunctioning battery, an unexplained disconnection from the grid, an incorrect power configuration on a site, a faulty rectifier module.

Trawling through vast troves of real-time operational data from thousands of base stations and towers, data science algorithms automate detections of anomalies and patterns at a scale that has not been easily accessible to engineers and operators before. This unique insight into potential problems puts the TowerCo – for the first time – in the driving seat of preventative maintenance and problem-solving.

Now, instead of having a maintenance truck roaming a region stacked full of replacement parts that might be needed in the event of an unforeseen failure of the renewable power generation system, a real-time feed with granular fault diagnostic can alert an O&M team that a specific circuit breaker has failed at a specific site which can then lead to a high probability of the renewable storage system running out of back up power or ending up costing a lot more to keep the site running. A targeted intervention can take place, under conditions and on a schedule controlled by O&M teams.

This predictability has ripple effects through a TowerCo's OPEX. As well as reducing miles driven to sites, maintenance fuel costs, wear and tear on vehicles, risks to human lives and potential losses due to environmental hazards, CFOs can stabilize and forecast cashflow better than ever before. It extends the window of financial predictability, which in turn benefits the roll-out of new regions and 5G base station in-fill.

In 2023, demand for our technology has grown exponentially. With large scale deployments across the African markets, we have seen applications tailored to the most pressing local need for efficiency gains and OPEX reduction. Customers in Uganda, for example, were looking to leverage significant investment in solar panel technology, having identified that their solar real estate was not working as optimally as it should. Our AI-driven data analytics pinpointed multiple efficiency gains and by the end of the year their solar yield exceeded their target. ■

Looking ahead: For 2024 and beyond, the tower industry will experience a seismic shift away from analogue, manual processes toward digitisation.

The benefits of embedding data intelligence tools into business processes and digitizing infrastructure management allow TowerCos and MNOs to automate workflows, compress time to revenue, reduce headcount, produce savings at scale and disseminate data across the enterprise to all stakeholders, opening up at the same time new opportunities for more efficient energy management to meet the stringent sustainability goals that shareholders demand.

Tom Greenwood,
CEO, Helios Towers

There is a huge growth opportunity in Africa. Although we have doubled the company's size in the past two years through acquisitions and now have 14,000 towers across nine markets, this growth has come with its own unique set of challenges.

In Africa, we have vast geographies to cover and significant infrastructure and power challenges. The land mass is 60% larger than in our EU markets, but we only have a fraction of the tarmac roads. Connectivity between the sites is often challenging, and grid availability is 16 hours on average per day versus 24 hours a day in the EU.

Many people in our markets are more used to having a mobile phone signal than power in their own homes. In the DRC, the grid is only available on average seven hours per day, and in Madagascar, nine hours per day. However, over the last eight years, we have seen a 90% improvement in power uptime performance. Back in 2015, we were at around 22 minutes of downtime per tower per week. In 2022, we were at two minutes and 46 seconds. We are not stopping there - we have set ourselves a target for 2026, achieving 30 seconds of downtime per tower, equivalent to almost 100% of power uptime.

We invest in alternate power solutions to improve service reliability and reduce fuel consumption. Not only is this the most environmental action but it also reduces the utilisation of the most expensive form of energy to power a site. Today, 31% of our sites utilise solar or hybrid, something we are looking to drive over the future towards our target to reduce carbon emission by 46% by 2030 and ambition of being Net Zero by 2040.

"We are seeing strong demand from mobile operators to expand coverage and upgrade technology from 2G to 3G, 3G to 4G, and 4G to 5G. There is significant growth ahead given most of the technology in our markets is still either 2G or 3G."

We are seeing strong demand from mobile operators to expand coverage and upgrade technology from 2G to 3G, 3G to 4G, and 4G to 5G. There is significant growth ahead given most of the technology in our markets is still either 2G or 3G. In more urban locations, rather than using a 50m-tall tower, we use products that are better adapted to more densely populated areas. In-building systems, outdoor desks, street furniture and lampposts with small antennae are all products that help fulfil the demand for connectivity, along with addressing the need for infrastructure to support newer technologies. Our colocation model, which can concentrate up to six tenants on a tower, works efficiently to support our customers as they develop newer technologies. This also means that only one generator or power supply is needed for multiple network operators.

A trend we have seen, and one we expect to grow exponentially over the coming years, is a focus on sustainability. Colocation is a big factor in our Sustainable Business Strategy, but we are also committed to reducing our carbon

emissions through other means. As some areas in Africa have non-existent or unreliable access to mains electricity, we depend on generators to guarantee power for our customers. To reduce this carbon impact, we have pledged to invest US$100 million in low-carbon solutions, in an initiative called 'Project 100,' as part of our drive to reach our carbon reduction target.

In Africa, the markets where we operate are home to the most urbanised cities in the world. Kinshasa, the capital of DRC, has a population of 17 million people. By 2035, it is forecast to have 27 million people. It will be the next global mega city and will need 5,000 plus telecoms points as a service to get to that size.

Tower companies are real estate companies for mobile operators. The added service that Helios Towers offers is power. We are effectively a power company for our customers, whereby we provide our customers 99%, almost 100%, power uptime within what we do. We - and other tower companies in the region, of which there are not that many - need to have power expertise, which means that each of our 14,000 sites are essentially micro power stations as well.

For densely populated environments where there is poor mobile coverage and limited space for traditional tower infrastructure, we have developed innovative distributed antenna systems (DAS) to improve connectivity. The Tanzania Communications Regulatory Authority asked our customers to develop a solution for the Kariakoo Market – the country's biggest and busiest market. Coverage and capacity were a challenge and market vendors had been deploying their own boosters to try to improve their signal. We collaborated with our MNO customers to develop a future-proof solution that could accommodate multiple operators and support 2G, 3G, 4G and additional spectrum bands. We expanded coverage from an existing tower nearby to equipment on two existing lampposts in the market. We connected these to the grid and installed a battery backup system. This bespoke solution has significantly improved coverage and capacity and vendors both inside and outside the market building are now able to do business much more effectively.

Where possible, we always try to connect off-grid sites to a grid supply to reduce fuel consumption. In Tanzania, we have worked with TANESCO, the national electricity company, to expand the grid to more rural areas. In 2022, we connected 325 sites to the grid, reducing our diesel consumption. 83% of our sites in Tanzania are now connected to the grid. ■

Looking ahead: One of the core pillars in our Sustainable Business Strategy is '22 by 26' - growing our tower portfolio to 22,000 towers by 2026. The mobile industry is uniquely placed to contribute to all 17 UN SDGs and we believe that the benefits of a more connected future should be accessible to all. Today, our telecommunications infrastructure covers over 141 million people, and we expect this figure will grow to 250 million by 2026.

While striving towards this target, we have set parallel goals, such as having at least 30% female representation in our workforce by 2026. Meanwhile, we are aiming to train 70% of our colleagues in Lean Six Sigma by 2026, the principles that sit at the heart of our people development.

We are fully on track to become a Net Zero carbon emissions business by 2040 and we are extremely proud of how the business is championing sustainability and looking for ways to maximise our impact in the communities in which we operate.

Jerome Perret,
CEO, IT-Development

Over the past year, our fortunes in Africa have continued to reflect our enduring commitment to the continent. Our journey with Africa began in 2005, when we forged a first partnership in Cameroon with a subsidiary of Orange. Since then, our dedication to the African market has remained unwavering, expanding our presence across various countries in both West and East Africa.

In 2020, we reached a pivotal milestone by securing the group contract with MTN, marking a significant achievement for our team. We have already implemented ClickOnSite in South Africa, and we are in the process of extending our services to other countries within the region and the group.

An African burgeoning population creates a demand for robust infrastructure, offering fertile ground for our services. However, navigating diverse cultural landscapes presents unique challenges. Adapting to regional work methodologies is a primary hurdle. Addressing education gaps and pockets of illiteracy led us to implement visual aids like maps and graphics for better accessibility. Furthermore, operating in developing countries brings logistical complexities, with lengthy commutes for users being common. Despite these challenges, we view them as opportunities for growth and improvement, driving innovation to cater to the specific needs of the communities we serve.

"In 2023, I witnessed regulatory shifts in African markets. Interestingly, anticipated catalysts for our business - regulatory actions - didn't have the expected impact."

A notable African trend is the focus on addressing rural technological needs. Companies like AMN are taking on this significant challenge. Even in developed nations like France, profitability hurdles exist in rural areas, raising questions about the sustainability of such ventures. This demonstrates commendable ambition. The interest in these underserved regions highlights the importance of connectivity for rural communities. There's a substantial market opportunity for solutions bridging the digital divide and providing essential services. Monitoring progress in initiatives targeting rural Africa is vital, ensuring a balance between ambition and economic viability for long-term success.

In Africa, the adoption of 5G technology has been notably slower, from my perspective at least. African countries approach this technology as cautious followers, questioning its practical benefits. While consulting firms and vendors heavily promote 5G, actual demand on the continent remains limited. This sentiment is echoed by many CTOs of major African mobile network operators. This cautious approach reflects a prudent evaluation of technological investments, with African markets prioritizing practical applications. It's crucial to acknowledge that infrastructure and user base in Africa differ from more mature markets, influencing the pace of technology adoption.

For me, the standout success story from 2023 is Axian Group's rise. Its increasing prominence positions it as a key player in Africa. Drawing

parallels between Hassanein Hiridjee and Xavier Niel, both catalysts for change in their territory, is inevitable. Like Niel's tech disruption, Hiridjee's dynamic approach in Africa promises to reshape business. With Axian's trajectory, expect ongoing surprises in innovation. This success story underscores how visionary leadership fuels meaningful transformation and innovation in the African market like in any other.

In 2023, I witnessed regulatory shifts in African markets. Interestingly, anticipated catalysts for our business - regulatory actions - didn't have the expected impact. Fines on mobile network operators aimed at spurring mobile development were notable, yet surprisingly, didn't affect our business. This highlights the intricacies of African regulatory dynamics. I remain vigilant, engaging with local authorities for compliance. Despite varied impacts, I acknowledge the second pivotal role of regulatory frameworks in shaping Africa's telecom landscape.

"I foresee a surge in towerco development across Africa in 2024, driven by strategists like Christel Heydemann, CEO of the Orange Group."

The nature of our work necessitates a collaborative approach across borders, and we have experienced a positive environment for ClickOnSite in 2023. This has allowed us to forge valuable partnerships and leverage collective expertise to address the unique challenges and opportunities that the African market presents. ■

Looking ahead: In 2024 and 2025, the African market is witnessing a surge in data centre development. This complements and, at times, competes with mobile services, addressing the low fixed internet penetration. Additionally, there's a global push for enhanced asset management, notably gaining traction in Africa, aligning with international standards. These advancements signal a maturing tech landscape in Africa, poised to influence the market's direction.

I anticipate that the most vibrant countries or regions in Africa will likely be those with high population density. These areas tend to exhibit higher levels of innovation and dynamism compared to others. The concentration of people often leads to a greater demand for technological solutions, which in turn fosters a fertile ground for innovation and economic growth.

Looking ahead to 2024 and 2025, we remain optimistic. As Africa's significance in the global market continues to grow, we anticipate an even greater need for collaborative efforts to drive innovation, development, and sustainable growth across the continent. Our commitment to Africa and our current customers position us well to play an active role in this landscape.

I foresee a surge in towerco development across Africa in 2024, driven by strategists like Christel Heydemann, CEO of the Orange Group. Their determined efforts to maximize regional assets are poised for impact, potentially reshaping the sector. While it may not emulate a conventional towerco like TOTEM, these strategic initiatives change the way towers and assets are operated on the continent.

Industry leaders adopting a proactive approach, leveraging existing infrastructures, and innovating for sustainable expansion, highlight Africa's dynamic telecom landscape. This forward-thinking is set to propel substantial progress, foster fresh collaborative opportunities, and ultimately elevate connectivity and accessibility of services continent-wide.

Sumedha Tatke,
director – marketing and product management, Tarantula

Tarantula is a global software company and a proven market leader in telecom site management solutions. As a trusted advisor and long-term partner for tower site owners and operators in more than 30 countries worldwide, we are a vital part of the daily management of more than 450,000 towers and US$50 billion worth of assets across the world. Africa is an area of strong focus for us, with several leading multi-country towercos using our product to manage their tower portfolios.

We have been very active in Africa over the past year, enhancing our brand awareness and increasing our footprint. We signed up with a multi-country towerco that is continuing to expand in the region, and we are deep in the deployment process of our site management solution for them. We also continued our partnership with our existing customers in the region, while enhancing our product capabilities to deliver additional value.

The African market is no different to the rest of the world when it comes to tower carve-outs, M&A transactions, and diversification of the products being offered by infrastructure providers.

Similar to the US and European market, the MNO trend of carving out tower portfolios into separate tower companies continued in Africa as well in the last 12 months. We also saw many tower companies getting into the fibre domain, offering backhaul and dark fibre to the tower as new products to their customers. Last but not least, we saw the ongoing trend of densification and upgrades to towers in the region as towercos needed to provide sustained services to their customers.

Interestingly, despite the high demand for digitalization and site management tools, we saw a huge dependence on manual data capture and siloed data systems that did not talk to each other. This was all the more evident from the lack of automation in contract management and customer billing areas.

The towerco-MNO framework contracts are extremely complex, with multiple levers having an impact on the tower cash flow. However, empowering towercos with the appropriate tools to have a single source of truth in the correct contract data as well as customer usage information, ensures that customer billing is accurate and reliable. This was a great opportunity for us to provide a platform for business process automation with centralization of asset, contract, project, and process information, generating billing data and tower cash flow analysis.

The biggest differentiator between the African markets and other global markets is the energy requirements.

With low grid connectivity and limited use of renewable or alternative energy sources, tower owners continue to rely on diesel for ensuring power to the tower. As towercos start to offer energy as a service to increase their stickiness with their customers in many markets, we will continue to see digitalization and optimization requests from our customers on the energy management front. ■

Looking ahead: The need for centralized site management as well optimization of rollout and operations cannot be emphasized enough. With siloed departments managing site data through manual operations, tower owners are consistently turning to digitalization tools to automate business processes and data collection. As we go into 2024 and beyond, our deep expertise in this domain will be the cornerstone of optimizing site portfolio management.

Rupert Chappell,
sales director, telecom EMEA, vHive

In the evolving landscape of Africa's telecommunications sector, vHive enters with a mission to enhance connectivity for African communities. Recent successful projects led by vHive and prominent TowerCos in Africa serve as a beacon of innovation, ushering in a new era of digital transformation to the region and establishing the company's strong footprint in the continent.

Renowned as an established industry leader in the US and European telecommunications markets, vHive is now set to embark on a transformative journey across Africa, setting the stage for accessible connectivity, one tower at a time.

Africa presents a unique tapestry of challenges and opportunities. Just as rivers were once integral to the prosperity of villages, connectivity through modern towers has become a critical enabler for these communities to thrive in today's global landscape. Today, TowerCos purposefully construct their towers near rural, underserved communities, recognizing that development follows connectivity, which is key for global commerce participation.

Power instability emerges as a significant hurdle, with a considerable portion of assets operating off-grid. In countries like Nigeria, escalating energy costs compound the challenge, necessitating innovative solutions for sustainable tower operations. Safety regulations and security concerns, including theft of tower components, further underscore the complexities.

The digital divide persists as a critical concern, delineating those with internet access from those without. vHive's solution emerges as a catalyst for mitigating this divide, collaborating with TowerCos and MNOs to bridge the gap. By providing accurate tower data, vHive empowers these entities to optimize resources and extend connectivity to underserved populations.

Amidst challenges, opportunities abound. The youthful population, known for its tech-savvy mindset, can eagerly embrace technologies such as drones and AI/ML. This affinity not only presents efficiency for tower-related tasks, but also positions them as valuable contributors in adopting new methods and technological proficiency. The transformative power of connectivity is emphasized, positioning TowerCos and MNOs as catalysts for integrating African communities into the global economy.

Ownership changes and the quest for AI solutions define the evolving African telecommunications landscape. Tower owners and operators seek to unravel the complexities on their structures, employing AI to detect overloading issues and equipment discrepancies. From an MNO perspective, the discrepancy between As-built and As-planned configurations poses challenges. The dependence on manual survey methods is evident, necessitating automation for accurate, consistent, and shareable data.

This year, we were also announced Best-In-Class Software Platform for Asset Digitization by Frost & Sullivan, which we're very proud of. It's been recognized that. for TowerCos, a unified view and understanding of the tower's performance and potential value, with a visual cloud-based platform serving as a single-source-of-truth with photorealistic 3D tower replicas, is the future. AI and computer vision analytics quickly identify equipment and issues, providing instant insights into asset conditions and profitability.

For one example, we have worked with one of South Africa's largest TowerCos to resolve the

"Surprisingly, Africa showcases a readiness to adopt these new technologies, surpassing even more developed regions. Tower owners and operators exhibit a progressive approach, acknowledging the imperative to stay ahead in a rapidly evolving landscape. The transformative potential of digitization in Africa becomes a beacon of hope, driving connectivity advancements and reshaping communities."

issue of accurately accounting for changes on towers. Our digital twin solution, which features autonomous data capture, advanced AI analytics and intuitive 3D simulation software, removes the complexity and limitations of manual data collection, by using low- cost, off-the-shelf drones controlled by a powerful software platform. The simplicity of data capture uses autonomous auto discovery drone technology, enabling an optimal amount of accurate data, systematically, easily and at scale.

With our solution, the South African client was able to significantly reduce its inventory records, to 45% less equipment compared to the typical TowerCo. The user-friendly 3D simulation capability allows TowerCo teams to easily explore vertical space possibilities, add new levels, and accommodate new tenants effortlessly to expedite new equipment installations and seize every opportunity for growth.

Surprisingly, Africa showcases a readiness to adopt these new technologies, surpassing even more developed regions. Tower owners and operators exhibit a progressive approach, acknowledging the imperative to stay ahead in a rapidly evolving landscape. The transformative potential of digitization in Africa becomes a beacon of hope, driving connectivity advancements and reshaping communities.

While TowerCos predominantly gravitate toward South Africa and West Africa, MNOs span across the continent, collectively propelling digital transformation. Cross-border collaboration emerges as a prominent trend, fostering a collaborative environment for technology adoption. In this scenario, even smaller players find avenues to contribute to multinational groups. ■

Looking ahead: Africa, with its vast complexities and opportunities, stands as a colossal opportunity for vHive – we are well-equipped to handle local nuances and support the continent's growth. With ongoing and upcoming projects, this marks just the beginning for vHive's in Africa.

In a continent where connectivity is synonymous with progress, vHive's mission aligns with ensuring MNOs' equipment is optimized and TowerCos' returns are maximized, for productive and profitable tower operations. By doing so, vHive aims to join telecom stakeholders in reshaping the narrative, enabling entire villages to become vital nodes in the global economy. The journey toward digitization in Africa is not just a project; it's a transformative odyssey, and vHive is committed to be at the forefront, steering Africa toward a connected future.

Yusuf Paruk,
chief financial officer,
Insite Towers Co.

Carla Da Silva Caires,
national sales director,
Insite Towers Co.

Andrew Edmondson,
chief executive officer,
Insite Towers Co.

Jason Legassick,
chief commercial officer,
Insite Towers Co.

South Africa has its share of challenges, but within those challenges, we see opportunities. Take our growing population, for instance - more people means a greater demand for improved and faster communication. However, when you venture outside our cities, you'll notice a significant lack of basic services like reliable power supply and essential infrastructure.

Accordingly, we offer comprehensive solutions that benefit various groups in our ecosystem. We've designed tailor-made solutions that encompass both infrastructure and power provision. This allows us to establish mutually beneficial partnerships with community centres, such as schools, and private homes. Our goal is to provide a platform for easy access to information and communication, bridging gaps in time and space.

We believe that solving these issues can't be done in isolation - it's a collective effort. It requires the seamless integration of physical infrastructure, power supply, and cooperation from mobile network operators; and calls for a sensitive and realistic collaboration between us and the communities we work with. Together, we can make a real difference.

The African market needs access to power, infrastructure and cellular networks. Unfortunately, we are lagging in this regard. However it is narrow-minded to think that a single technology is going to fix a problem – it requires an understanding on the market at large and being able to tailor unique solutions for our customers.

Unique solutions encompass multiple factors, and this is why we put plenty energy and time into creating strong relationships that focus on the bigger picture, not just a solution for 'right now,' because it is the key to success for everyone... fostering a solid partnership means showing up and delivering on your word, especially in communities where the need for connectivity is pervasive.

Our standout success story of 2023 is undoubtedly our Lebalelo tower in Limpopo province. Aside from the sheer breathtaking beauty of the site, the tower is built in a remote, hard-to-reach and inhospitable location. There are no tarred access roads and no power infrastructure around the site, yet we have successfully built a tower, provided power as a service for our customers while also providing a secure container to house each of our customers' individual infrastructure.

We have literally provided off-grid power, from mainly green generation sources. This has enabled the tower to link, several, remote communities and therefore is an attractive opportunity for mobile network operators. ■

Looking ahead: We are placing greater emphasis and energy on bridging the digital divide and expanding into rural areas that have largely been left behind.

Success is about creating strong partnerships and the needs of the mobile network operators provides the impetus for us to go out there and build towers in rural, remote and hard-to-reach places. Therein exists a symbiosis where each party, including the surrounding community, has something to gain in the process.

Powerx Technology Ltd.
45 Gresham Street,
London,
EC2V 7BG
marketing@powerx.ai

About us

Contact us

Solutions

PowerX, a Software-as-a-Service company, provides the market-leading data intelligence platform for managing and optimising energy assets. The platform's advanced data science tools and workflows, integrated with enterprise business processes, deliver efficiency, resilience and sustainability for critical asset operations. In telecommunications, for example, the PowerX solution has achieved auditable 15%-30%+ energy and maintenance cost reductions, asset utilisation improvements, CO2 emission reductions and revenue assurance.

PowerX is a highly scalable, hardware agnostic platform that is quick and easy to deploy. The solution leverages AI to automate improvements and processes at scale helping operational teams identify inefficiencies, prioritise responses and manage to resolution with detailed diagnostics and integrated workflows. The result is enterprise-wide visibility, specific insights and automated control actions, with increased workforce productivity, reduced cost and site-level efficiencies at scale across large, distributed estates.

Find out more: www.powerx.ai

Tarantula Global Holdings Pte. Ltd.
101 Cecil St,
10-11 Tong Eng Building,
Singapore, 069533
Telephone: +65 6407 1021
www.tarantula.net

Red Cube

Services

Resources

Customers

Tarantula is a global software company and a proven market leader in telecom site management solutions. We are a trusted advisor and long-term partner for tower site owners and operators in more than 30 countries worldwide. We leverage our extensive industry knowledge to empower our customers to build profitable and sustainable businesses. Through an end-to-end, purpose-built telecom site portfolio management solution and knowledge-driven services, we are a vital part of the daily management of more than 450,000 towers and US$50 billion worth of assets across the world.

Tarantula is owned by Lumine Group, a division within Volaris Group, a subsidiary of Canada-based Constellation Software Inc. Our offices are situated in Singapore, UK, and India. For further information, please visit: www.tarantula.net