chapter 7 Fibre

Paul Hamilton, director, Hamilton Research Ltd, Africa Bandwidth Maps

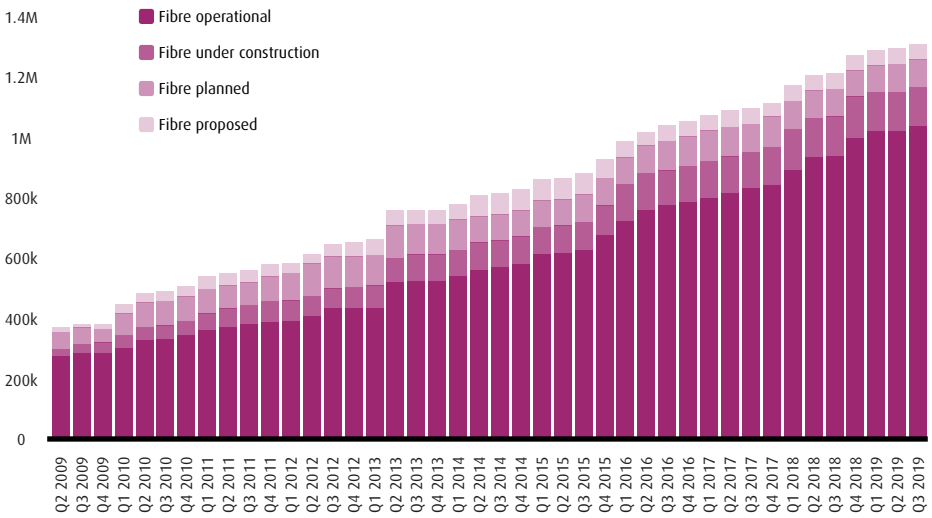
Africa's total inventory of operational fibre optic network reached the milestone of 1 million kilometres in the last year, increasing the number of people living within reach of a fibre optic node in Sub-Saharan Africa to 584 million people. More broadband customers, with more bandwidth per customer, continues to drive Africa's international Internet bandwidth growth along an exponential curve, reaching 10.962 Tbps by December 2018.

Terrestrial Fibre Networks Reach 1.025 Million Route-Km

According to the eleventh annual edition of the Africa Telecom Transmission Map published by Hamilton Research for 2019/20, the inventory of operational fibre optic network reached 1,025,441-km by June 2019 compared to 936,102-km in 2018, 820,397-km in 2017, 762,167-km in 2016, 622,930-km in 2015, and 564,091-km in 2014. Ten years ago in June 2009, the total fibre inventory was 278,056-km (see chart 1 below). In the twelve months since June 2018, an additional 88,339-km of fibre optic network has entered service, an average of 244-km of new fibre optic network entering service per day. In addition, there was in June 2019 a further 132,088-km of fibre optic network under construction, 89,610-km planned, and 50,159-km proposed.

The eleventh edition of the Africa Transmission Map shows the networks which are operational, under construction, planned and proposed for a total of 317 network operators and 65 submarine cable systems. Africa's total inventory of terrestrial transmission networks increased to 1,474,983-km by June 2019, compared to 1,389,475-km by June 2018, 1,254,413-km in 2017, 1,179,010-km in 2016, 1,019,649-km in 2015, and 958,901-km in 2014. Ten years ago in June 2009, the total inventory of terrestrial transmission networks was 465,659-km.

Chart 1: Route-Kms of Terrestrial Transmission Network, Africa 2009 - 2019



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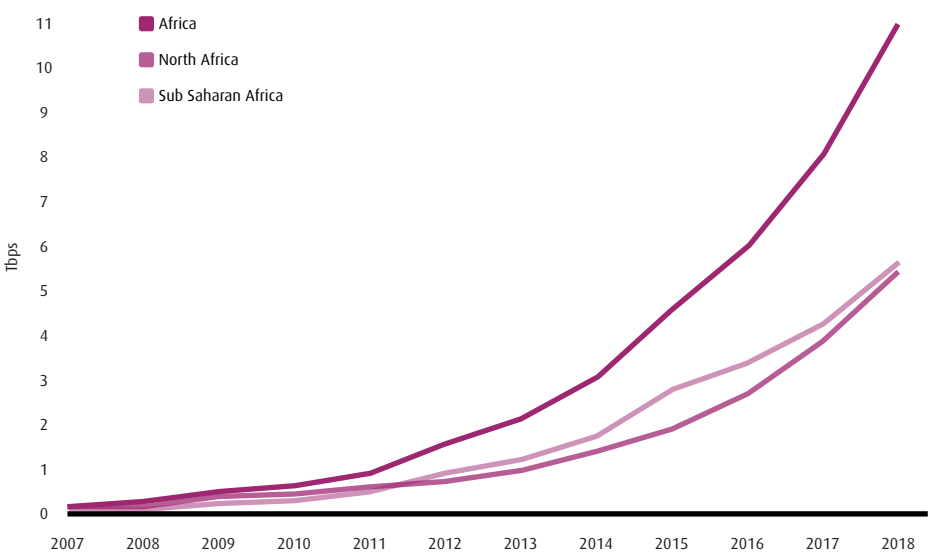

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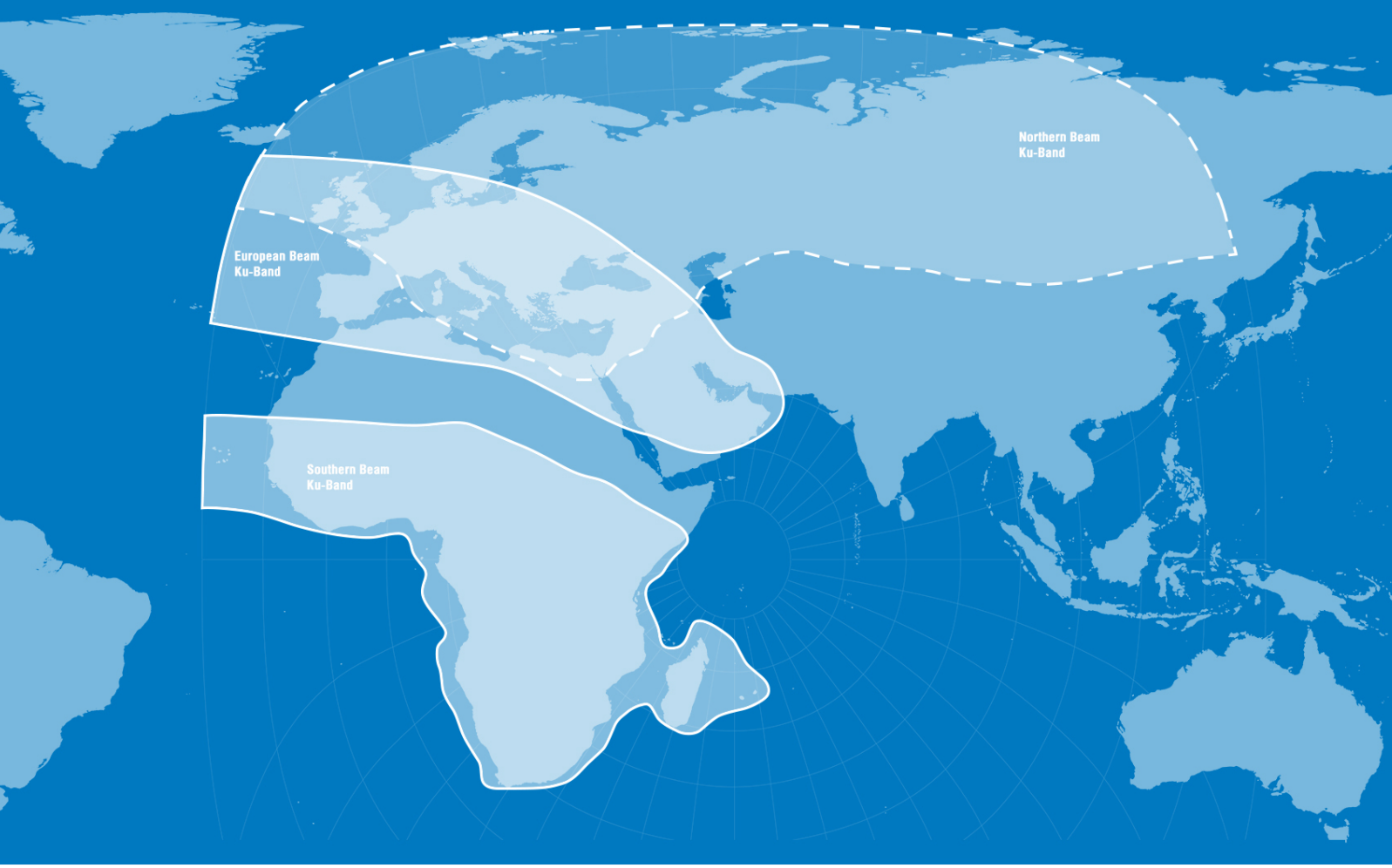

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Fibre Networks Reach Increases To 55.2% Of Sub-Saharan Africa

The expansion of terrestrial transmission networks continues to bring additional countries, regions, cities and towns within reach of fibre networks for the first time. In June 2019, 584 million people lived within a 25-km range of an operational fibre optic network node, compared to 556 million in June 2018 and 259 million in June 2010.

In June 2019, 55.2% of the population in Sub-Saharan Africa (584 million) lived within a 25-km range of an operational fibre optic network node. This compared to 54.2% (556 million) in 2018, 52.1% (522 million) in 2017, 48.1% (469 million) in 2016, 45.8% (436 million) in 2015, 44% (410 million) in 2014, 41.8% (371 million) in 2013, (345 million) in 2012, 36.3% (313 million) in 2011, and 30.8% (259 million) in 2010. Once the fibre network which is currently under construction enters service, the fibre reach of Sub-Saharan Africa will increase to 56.4% (597 million), and once the network which is planned or proposed enters service it will increase to 61.0% (646 million).

Since 2010, network expansion has brought more than 325 million more people within access to high capacity national and international backbone networks. In the last year an additional 28 million people were brought within 25-km range of an operational fibre node. This included an additional 3.404 million people in Guinea, 3.156 million in Nigeria, 3.026 million in Uganda, 2.068 million in DRC, 1.927 million in Benin, 1.620 million in Kenya, 1.135 million in Madagascar, 1.165 million in Ethiopia, 1.189 million in South Africa, and 1.008 million in Senegal.

Africa's International Bandwidth Reaches 10.962 Tbps

Africa's total inbound international Internet bandwidth reached 10.962 Tbps by December 2018. This compared to 8.013 Tbps in 2017, 5.934 Tbps in 2016, 4,506 Tbps in 2015, and 2.982 Tbps in 2014 (see also Africa: Africa's International Bandwidth Reaches 7.939 Tbps in 2017). Ten years ago in December 2008, Africa's total bandwidth was just 115 Gbps.

The chart below shows that the total international bandwidth of 10.962 Tbps was split between Sub-Saharan Africa, which increased by 32% to reach 5.568 Tbps, and North Africa

2019/20 Africa Telecom Transmission Map

JANUARY 2019

Telecom Egypt is claimed to have doubled the capacity on its Delta Region DWDM backbone network. Commercial deployment of its new high-speed service started earlier last year and is said to represent the first 200G long distance, single carrier transmission service in Africa. The operator's MD and CEO Ahmed El-Beheiry says: "Doubling capacity on our existing backbone allows us to offer high-speed broadband and LTE services in addition to 100GE services for mobile operators, while reducing costs." With growth in demand for mobile video and ultra broadband services, Telecom Egypt worked closely with Nokia to enhance its current backbone network. It's claimed that by upgrading its existing Nokia Photonic Service Switch (PSS) 1830 switches with the vendor's Photonic Service Engine (PSE) technology, the operator has not only doubled its capacity but has also reduced its operating costs. The deployment includes Nokia's 500G DWDM muxponder, a programmable card that is said to provide wavelength capacities from 50G to 250G per line port. Based on Nokia's PSE coherent digital signal processor, this programmability is designed to allow Telecom Egypt to provision and tune wavelength capacity per optical route to ensure that its network is operated at peak performance, capacity and lowest cost-per-gigabit. "This is exactly what we had in mind when we designed the 1830 PSS platform," says Nokia's MEA head Amr El-Leithy. "Its flexibility and easy upgradability will allow [Telecom Egypt] to proactively manage the data explosion and develop new revenue streams – all the while improving the experience for their customers."

FEBRUARY

MainOne has entered into a partnership with Facebook to roll out a metro fibre infrastructure project in two states of Nigeria. The infrastructure collaboration is part of Facebook's efforts to connect more people to broadband internet. As part of this project, MainOne is building and operating approximately 750km terrestrial fibre infrastructure in Edo and Ogun States, two of Nigeria's fastest-growing states, with a combined population of seven million.

MARCH

March saw the opening of Dark Fibre Africa (DFA) of its office in Harare, marking its expansion into African markets outside of its home base in South Africa.

DFA an open-access fibre telecommunications firm announced that its new Harare hub will be headed up by Simon Chimutsoto, who has "extensive experience" in rolling out telecoms infrastructure in Zimbabwe, Zambia and South Africa.

DFA said it plans to roll out a high speed fibre network in Zimbabwe, which will be made available on a wholesale open-access basis.

"We have rolled out network infrastructure in all of the major South African metropolitan areas and have extended our footprint to large and small towns, amounting to over 13,000km of ducting space, said DFA executive for strategy, mergers, acquisitions and innovation Vinno Govender. "Our entry into Zimbabwe is in line with our strategic intent of expanding into sub Saharan and other African markets.

APRIL

Telecom Egypt signed a landing party agreement worth USD45m with Pakistan and East Africa Connecting Europe (PEACE) Cable International Network and PCCW Global, the international operating division of HKT, the Hong Kong telecom service provider. PEACE is a 12,000 km long cable system with landings in Pakistan, Djibouti, Egypt, Kenya and France and provides open, flexible and carrier-neutral services for its customer base. "The PEACE cable will cross Egypt through new diversified terrestrial routes between the Zafarana and AbouTalat cable landing stations, where Telecom Egypt will provide PEACE with brand new state of the art landing facilities," said the Egyptian firm. Telecom Egypt's managing director and chief executive officer Adel Hamed said that the deal marks the addition of another cable system to Telecom Egypt's vast network of submarine cables, "exhibiting clearly that Egypt is the ideal digital route and partner of choice" for international traffic from the east to the west.

"Telecom Egypt boasts several differentiation factors in the submarine cable industry that will enable it to realise its vision of becoming a regional and African digital hub for content providers," Hamed added. Headquartered in the

which increased by 42% to reach 5.394 Tbps. Excluding Kenya, which reached 1.142 Tbps in 2018 (source: CA), the total bandwidth for other countries in Sub-Saharan Africa increased by 34% to reach 4.426 Tbps in December 2018.

All of Africa's international bandwidth is supplied by submarine cables, terrestrial networks connected to submarine cables, or satellite. Of the total bandwidth of 5.568 Tbps in Sub-Saharan Africa by December 2018, 5.077 Tbps (91.2%) was supplied directly by submarine cable, and 479 Gbps (8.6%) was supplied by terrestrial cross-border networks connected to submarine cables. Ten years ago in December 2008, the amount of international bandwidth supplied by submarine cable was 102Gbps. ■

Year in review

Fibre optic deployment in Africa during 2019, was underpinned by the need for secure and high-speed connection to boost African economic growth. It is beyond argument that there is a demand in Africa for fibre to improve broadband connection. It has been estimated that the continent needs an additional half million kilometers of fibre cable just to provide a reasonable level of connectivity. At present it is estimated that Africa has just over 1 million kilometers of fibre optic networks installed. This comes at a financial cost when cable installation can exceed US$30,000 per kilometre or US$15bn for additional 500,000 Km.

Silicon Valley eyes African cable deployment

2019 was a good year for African cable deployments and was boosted by the involvement of both Facebook and Google, both of whom tentatively disclosed their respective undersea cable investment intentions.

Google adopting a sensitive approach to Africa, (bearing in mind America's last major involvement in Africa) has named their cable project Olaudah Equiano.

Facebook has gone for a more Disney orientated approach calling their project Simba, the Swahili for lion. But in all seriousness, this could be the way forward for interconnection for Africa. Large corporations such as Microsoft, Google and Facebook are awash with cash and diversification into future profit bearing areas is a sensible business strategy for them.

It can only be a win-win scenario for Africa, with potential billion US dollar cable investments and those cable deployments being made with state-of-the-art cable giving high speed, high capacity ability to cover Africa's needs for a few years. Given the size and wealth of these American enterprises it is possible that they may also exhibit a social responsibility aspect and provide funding for social projects for the poorer nations of Africa.

Land based Fibre spreads across the continent

Several developments in 2019 have seen inter region connectivity increase in Africa.

Orange accelerated its development of connectivity in Africa with a new secure international network to connect eight West African Countries. The announcement by Orange that it was constructing a new international backbone network in West Africa was welcomed at the AfricaCom congress

capital Cairo, Telecom Egypt has 17 subsidiaries operating across British Islands, western Europe, northern Africa and the Middle East.

MAY

Telecom Egypt signs agreement for PEACE cable system. A landing agreement was signed with a value of US$45m. The agreement was between Pakistan and East Africa connecting Europe (PEACE) Cable International Network and PCCW Global, the international operating division of HKT, the Hong Kong telecom service provider.

The company clarified that PEACE is a 12,000Km long cable system with landings in Pakistan, Djibouti, Egypt, Kenya and France that provides open, flexible and carrier-neutral services for its customer base. "The PEACE cable will cross Egypt through new diversified terrestrial routes between the Zafarana and Abou Talat cable landing stations, where Telecom Egypt will provide PEACE with brand new state of the art landing facilities," said the Egyptian firm.

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JUNE

In June Paratus rolled out its fibre infrastructure in Gobabis, Namibia. Paratus is offering capped and uncapped packages starting from N$620 for 100Mbps and N$785 for 10Mbps.

Paratus has completed a national fibre project, connecting from the WACS landing station in Swakopmund eastward to the border of Botswana. Andrew Hall, managing director at Paratus Namibia said it was a natural progression for the company to start connecting towns en-route of the first privately owned national backhaul fibre network through Namibia. Andrew Hall expressed his appreciation to Gobabis city councilor Liberius Kalili and the Gobabis team, who were very approachable on the idea of moving ahead with installing fibre infrastructure and its subsequent operational roll-out.

JULY

Google unveiled plans for a new private subsea cable system to connect Africa and Europe and sought partners to help link it with various countries along its proposed route.

Named Equiano it will start in western Europe and run along the west coast of Africa, between Portugal and South Africa.

It will also incorporate branching units along its route, which can be used to extend connectivity to several African countries. The first branch will land in Nigeria.

Fully funded by Google, it is the internet Giant's third private international cable after Dunant, which connects the US to France and Curie, which connects Los Angeles, California with Valparaiso, Chile.

Equiano is named after the Nigerian born writer and abolitionist Olaudah Equiano, who was enslaved when a child. Its infrastructure is based on space-division multiplexing (SDM) technology, which Google stated means more than 20 times network capacity compared with the last cable employed to serve the region.

Phase one of the project, which will incorporate optical switching at the fibre-pair level, connecting Portugal to South Africa is scheduled for completion in 2021.

AUGUST

Frogfoot Networks, an open access fibre network provider, rolled out fibre network infrastructure in Protea Glen, Soweto, in a phased approach, with up to 20,000 homes and businesses to benefit from access to affordable, reliable broadband connectivity.

"Providing world-class connectivity has been the main driver behind this project, and we are excited to be the first fibre to the home (FTTH) provider in this area. Increased access to the internet can help improve economic growth in the region," said Shane Chorley, head of sales at Frogfoot.

The areas being covered as part of the infrastructure rollout are Protea Glen East and West, with work starting in the West. This region will be divided into 10 zones, while Protea Glen East will comprise 11 zones. It was expected that the first zone covering 1,000 houses would be completed by the end of September.

SEPTEMBER

Broadbased Communications, an open access metropolitan fiber optic network operator, has

in Cape Town. The network will be constructed around a land based fibre optic network linked to submarine cables that will benefit from centralized monitoring. It will link the West African cities of Dakar, Bamako, Abidjan, Accra and Lagos. Orange stated that the network was designed to provide large-scale international capacity and consequently, will help support the development of a digital ecosystem and meet needs in Africa.

In November Liquid Telecom announced its land based fibre link that will connect east to west Africa via the Democratic Republic of Congo (DRC). It comes as a progression from its 2,600 kilometre deployment across the DRC, which links the DRC to Liquid's One Africa, broadband network. The One Africa network enables connectivity of African states with each other and with the rest of the world. The One Africa network spans some 70,000 km and is increasing as Liquid Telecom continues its strategy to a more connected Africa. As Nick Rudnick Group CEO stated, "By linking the DRC to Liquid Telecom's rapidly expanding pan-African fibre network and the rest of the world the transformative infrastructure is creating a foundation for digital growth. Fast reliable broadband connectivity will advance society, fuel innovation and help champion pan-African trade."

The DARE1 submarine cable was completed in 2019. The system will have four landing stations expanding connectivity for Eastern Africa, to include Djibouti, Bosaso and Mogadishu in Somalia and Mombasa in Kenya. The cable has a length of nearly 5,000 Kilometres with three branching units and 41 dual stage repeaters. The landings were chosen to be in port cities and to facilitate interconnection with other cable networks around the globe.

The Director General of Djibouti Telecom, Mohamed Assoweh Bouth, stated, "we are very pleased that the DARE1 system is progressing on schedule and will be available for service in 2020. We understand the importance of bringing connectivity to eastern Africa and couldn't imagine a better company to partner with to achieve this mission other than SubCom." ■

Virginie Hollebecque, managing director, western Europe and Middle East, Ciena

For Ciena in 2019, 5G was a key driver that predominantly came in the form of making sure our customers' backend infrastructure was ready to cope with the increased capacity, higher speeds and lower latency that 5G promises.

"To support this, we announced several new products last year," says Virginie Hollebecque, managing director for Western Europe and Middle East at Ciena. "To specifically address network scale, cost and efficiency challenges from edge to core, we launched our WaveLogic 5 innovations, which deliver vastly improved network economics, reach, cost, power and footprint through WaveLogic 5 Extreme (WL5e) and WaveLogic 5 Nano (WL5n). We also invested in our market-leading automation software, Blue Planet with the launch of our Proactive Network Operations (PNO) solution to prevent up to 95 percent of network outages."

Indeed, Ciena also announced its Adaptive IP strategy that eliminates obsolete protocols from modern IP networks to help reduce storage, compute, complexity, and operating costs. The firm's packet and software solutions provide the building blocks needed to create a complete solution that offers closed-loop automation that delivers optimal IP connectivity, from access to metro networks, and enables network operators to simplify and expand IP connectivity closer to the network edge.

"We continue to grow as a business and last year acquired Centina, a leading provider of service assurance analytics and network performance management solutions, which we will integrate into our Blue Planet software to provide closed-loop, intelligent automation solutions that help our communications service provider customers improve operational agility," adds Hollebecque.

"There is a surge of activity on new submarine cables, some of which are close to finalising add/drop locations and designs"

penned a memorandum of understanding (MoU) with Dolphin Telecom, the operator of the African Coast to Europe submarine cable landing station in Nigeria. Under the terms of the deal, Broadbased will provide last mile metropolitan fibre optic network connectivity on a wholesale basis to Dolphin Telecom's clients including mobile telecom operators and internet service providers (ISPs) in Nigeria, a statement said. The ACE submarine cable system managed by a consortium of 19 telecom operators from Africa and Europe is being upgraded to 100G technology, which would increase its design capacity from 5.12 Tbps to 12.8 Tbps. It is supported by wavelength division multiplexing technology to accommodate future ultrabroadband networks. Broadbased operates a noncompete, non-discriminatory, open access Metropolitan fibre optic network spanning over 3,500km of transmission, distribution and in-premise, in all the major business districts in Nigeria's largest city, Lagos. The company's managing director and chief executive officer Henry Iseghohi said that the MoU was a testament to the company's dedication to the open access, non-compete model, robust network architecture and the dedication of his staff.

OCTOBER

Seacom's submarine cable system suffered an outage in October, which affected services. Seacom was the company to launch Africa's first broadband submarine cable along Africa's eastern and southern coasts. It announced the outage in a series of tweets, commencing with the news it was experiencing a service-affecting outage, between Mombasa in Kenya and Zafarana in Egypt. It affected all linear traffic between the east coast of Africa, to and from Europe. Seacom announced the outage on October 22, noting that customers with IP or other managed network services terminating between Dar es Salaam and South Africa would remain unaffected. The network was up and running the following day.

NOVEMBER

India's Sterlite Technologies (STL), announced a partnership with South Africa's Frogfoot to provide Fibre To The Home (FTTH) infrastructure in Soweto, Johannesburg. Frogfoot will use STL's Air-blown FTTH solution. It is claimed it will bring lower costs and faster time to market as well as providing affordable fibre connectivity to 20,000 homes in Soweto.

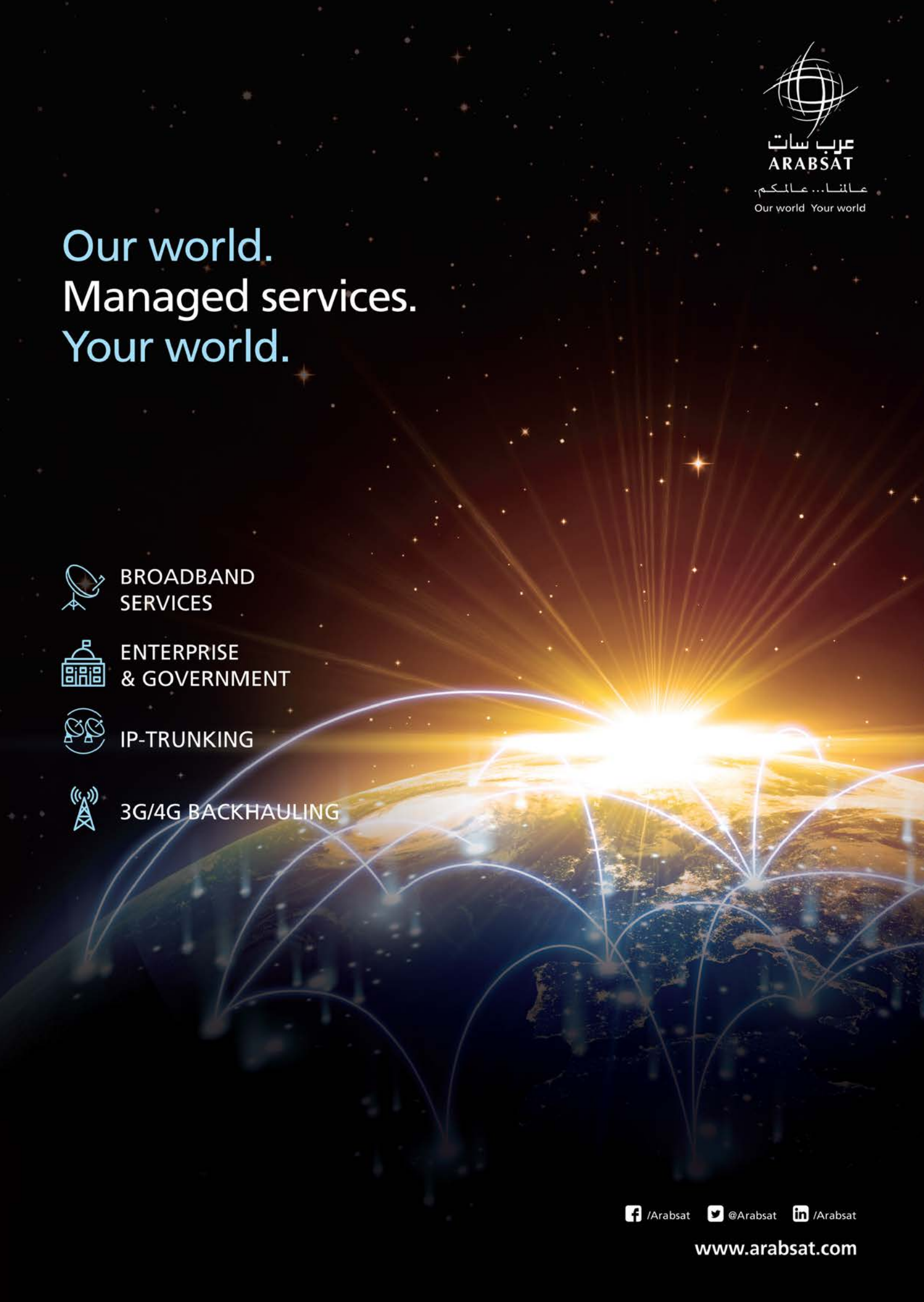
DECEMBER

Algeria and Mauritania in Fibre Optic link up as Algeria completes a 75km cross border fibre-optic link to Mauritania.

The deployment of the section was announced by Algeria's minister of post, telecommunications, technology and digitalisation, Houda Imane Faraoun.

Algeria is progressively forging links with other markets, having recently completed a 440km terrestrial fibre route over its southern border into Niger. Following extensive delays, Africa's largest country by land mass is also now connected to Spain via the 770km Oran Valencia (ORVAL) submarine cable, a partnership between Algérie Telecom IslaLink and ASN.

Originally scheduled to launch in Mid-2017, the cable can be upgraded to a capacity of 40Tbps and will offer Algeria more diverse international routes.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The African networking landscape is difficult to define in a single, overarching statement about the continent, says Hollebecque, who adds that mobile telephony is by far the dominant telecom service across Africa, accounting for more than 90% of all telephone lines on the continent - but how this relates on an individual market level is much more complex.

"There is a surge of activity on new submarine cables, some of which are close to finalising add/drop locations and designs. With the designs and locations being finalised, the focus will move onto the backhaul network to carry the traffic which will carry unprecedented bandwidth within the region," says Hollebecque. "Having said that, Terabit level demand is not yet developed in most terrestrial networks, so it may take some time to make it a reality. The requirements of Internet Content Providers are driving the demands in Africa, with some announcing new data centres within the region. Several are involved in funding these new submarine cables and they will have a need to move large amounts of data from the submarine cable landing stations to their data centres. Understanding and patience are key for this continent as it will take several years for the submarine cables to be built."

Hollebecque says 2020 will continue to be driven by 5G and the new applications and services which come to market. She says it's going to be an interesting year and one which is dominated by network infrastructure innovation. "We are already seeing 5G start its journey in Africa, and this will continue to be rolled out over the next couple of years," she adds. "Recently we also added several new products and capabilities to our 5G network solutions, fuelling the next wave of mobile connectivity." This includes Ciena's new open and programmable 5168, 5166 and 5164 Routers which enable soft and hard slicing with Segment Routing and FlexE switching for converged 4G and 5G xHaul over a common wireline infrastructure.

Jacques Visser, head of wireless, Vox

Seacom has been continuing to upgrade and improve its international backbone, particularly by lighting more capacity on its subsea cable which it owns and operates.

As far as the industry is concerned, Jacques Visser, head of wireless at Vox says 2019 saw the quality of wireless services improve tremendously with cost deflation driven by the availability of fibre backhaul, redundancy and improvement of wireless technology.

"The quality of wireless services improved tremendously with cost deflation driven by the availability of fibre backhaul, redundancy and improvement of wireless technology."

"The quality of wireless services improved tremendously with cost deflation driven by the availability of fibre backhaul, redundancy and improvement of wireless technology," says Visser. "LTE-A made a substantial contribution in the expectation to drive GSM data cost down in limited coverage areas. An unrealistic expectation was created about 5G, while the allocation of 4G and 5G spectrum to the industry failed. IoT solutions started to mature in commercial structures as networks, applications and devices were developing."

With regards to Vox, Visser says partnerships expanded the coverage of its satellite services to more geographical areas, including the Northern Cape locally, giving it for the first time coverage on Ka-band across the entire South Africa, as well as into much of sub-Saharan Africa.

"We introduced highly attractive uncapped data and voice satellite service plans at a price point that competes with LTE-A. These plans provide cost-effective connectivity to under-serviced regions in South Africa," he says.

Vox's biggest challenge, he says, was to position its wireless portfolio strategically to grow revenue and profits while fibre networks erected rapidly at a low price point. He says from a consumer point of view the quality and price deflation in fixed wireless "was significant".

Looking toward a new decade, Visser makes some bold predictions. "More efficient use and management of available spectrum, this includes white spaces, 5G rollout in the areas where fibre backhaul is available, backhauling of 5G networks by means of Low Earth Orbit (LEO) satellites and smart cars, planes and vessels connected through LEO satellites," Visser says.

David Eurin, chief strategy officer, Liquid Telecom

"Last year was another busy year for Liquid Telecom during which we saw our multi-award-winning fibre network reach 70,000km, the expansion of our data centres and an increase in our customer base across all sectors – consumer, enterprises and wholesale," says David Eurin, chief strategy officer at Liquid Telecom, the pan-African giant.

He says that during 2019, the company saw two big trends. The first was that global players continued their investment across the world investing billions in undersea cables to lower bandwidth costs and strengthen their global links. The second was that infrastructure investors have been investing massively in data centres in Africa. Eurin says that for Liquid Telecom as a well-established infrastructure player, data centres are a natural evolution for the company with synergies across the business.

"There is significant long-term growth in the market," he continues. "However, players who

Paul Hamilton, director, Hamilton Research Ltd, Africa Bandwidth Maps

The year ahead: There is plenty of room for future growth: this figure of 5.077 Tbps is still less than 3% of the total design capacity of at least 226.5 Tbps that is potentially now available on the 26 submarine cables serving the region in December 2018. This total design capacity has increased from 134.5 Tbps on 23 operational cables in 2017, 94.4 Tbps on 20 cables in 2016, 70.4 Tbps on 18 cables in 2015, and 60.3 Tbps on 18 cables in 2014. The increase of 92 Tbps seen during 2018 was with the entry into service of the G2A (20 Tbps), SAIL (32 Tbps), and SACS (40 Tbps) submarine cables. By the end of 2018 nearly a third of the total design capacity on cables (72 Tbps) landing in sub-Saharan Africa (230.5 Tbps) will connect directly to the Americas rather than Europe or Asia. The amount of bandwidth capacity which is activated (equipped) and sold is increased by increments in line with demand. The completion of new terrestrial cross-border links, and the expansion of capacity on others, has seen the volume of intra-regional traffic backhauled to submarine cable landing points increase by 37% in the last year to reach 479 Gbps in December 2018. This compares to 350 Gbps in 2017, 242 Gbps in 2016, 136 Gbps in 2015, and 103 Gbps in 2014. Ten years ago in December 2008 the amount of international bandwidth supplied by terrestrial cross-border networks connected to submarine cables was just 4 Gbps.

lack scale (geographically or across a diverse customer base) may struggle to develop their business. Liquid Telecom is thriving because we have operations across Africa, serving wholesale, enterprise, government, and retail customers."

When it comes to highlights in 2019, Eurin says there were many, but there were three most significant ones when it comes to Africa.

"East-West African Fibre Connectivity," he says. "In November 2019 we launched the fastest direct land-based fibre link connecting East to West Africa. This breakthrough coast-to-coast digital corridor followed the completion of our new high-capacity fibre link running 2,600km across the DRC and connecting the country to neighbouring Tanzania and Zambia with onward connectivity to our pan-African fibre network."

Another was in South Sudan. "We also announced that we have built and now operate South Sudan's first underground fibre broadband network which will make reliable and affordable internet connectivity available for the first time – and will ultimately create a foundation for digital growth, innovation and prosperity in this young country," Eurin adds. "5G. We have 56 MHz worth of spectrum in the 3.5 GHz band, which we used to launch South Africa's first wholesale 5G network."

As far as 2020 is concerned, Liquid will be opening new data centres to complement our existing ones in Nairobi, Cape Town and Johannesburg. "We will also be investing more in our digital services product portfolio and IoT," adds Eurin.

"People are optimistic about Africa's growth in general and so we will see more and more international capital coming into Africa. On the industry side I think that we will see cloud services providers launching services in new countries with more local hosting. For Liquid Telecom, we will continue our mission of building Africa's Digital Future as we believe that everyone has the right to be connected."

Byron Clatterbuck,
CEO,
SEACOM

As Africa's largest international network provider, 2019 proved to be an eventful year for SEACOM. It celebrated its tenth birthday and its sights were set on market consolidation, says Byron Clatterbuck, the company's CEO.

"We spent the year driving capacity and network diversity through investments, accelerating growth with targeted acquisitions, expanding our enterprise services into well-known markets and increasing scale with lit fibre deployment," he adds. All this to empower African businesses to go further – SEACOM's steadfast vision that inspires everything we do."

Clatterbuck explains how 2019 saw a wave of change across the continent, with key players like Amazon, Google, Microsoft and Netflix building larger footprints in Africa and increasing their computing, caching and storage capabilities. "As such, we continued to upgrade and improve our international backbone, particularly by lighting more capacity on our SEACOM Subsea Cable," he continues. "In doing so, we developed a three-way, internationally meshed network connecting Europe to Africa – enabling more cloud computing and content companies to deliver more resilient service offerings. And, in turn, driving improvements across the entire data communications ecosystem."

As part of SEACOM'S greater growth strategy, it recently concluded several ISP acquisitions, including MarcoLan and SAI. It added FibreCo to its list, "affording us with long-haul capabilities" to connect the East Coast of South Africa to the West Coast. "Meaning that bandwidth-starved cities and towns along our new fibre routes would finally enjoy affordable, high-speed Internet connectivity and cloud services," says Clatterbuck. "By owning more fibre assets, we can easily move to higher-speed technology, allowing us to exponentially increase the capacity throughout our fibre network."

SEACOM extended its presence in its brand-new data centre in Mombasa, Kenya and announced similar plans for the rest of Africa. With the addition of eight new Points of Presence (PoPs), more businesses can connect to cloud facilities globally. The firm also partnered with Raxio Uganda to launch the country's first carrier-neutral, enterprise-grade data centre in the first quarter of 2020.

Another achievement in the east African region – where the company was awarded a grant from the US Trade and Development Agency (USTDA) to initiate a feasibility study of the market potential for fibre services in Kenya, Uganda, Rwanda and Tanzania.

A second strategic partnership that helped it expand its African network was with Vodacom Business Africa, significantly augmenting the geographic reach for SEACOM Business clients across the continent.

"In line with our growth and evolving value proposition, we also revealed a refreshed brand identity," continues Clatterbuck. "Our bold new identity, featuring a vibrant colour palette and luminous accents, reinvigorates the SEACOM brand and personifies the digital revolution taking place in Africa."

Talking of 2020, Clatterbuck says South Africa" is one of our biggest markets" and it will continue to see a lot of our investment, interest and efforts. SEACOM'S next main market is Kenya – where the business will continue to push, grow and widen its network capabilities in the country. Clatterbuck says the company is also planning to launch SEACOM Business further into east Africa, in markets such as Uganda.

"SEACOM is excited about where Africa is heading. We know that the service we provide is crucial to driving development across the board by ensuring that there is reliable Internet connectivity to businesses and consumers," he adds. Cloud computing powerhouses and other major players can now come to the continent and deliver reliable services. SEACOM is the underlying data backbone that helps support African businesses to grow and, consequently, create more opportunities." The company is "therefore, optimistic about Africa" and will continue to invest and expand in its chosen markets.

Sami Yousif Mohamed,
CEO and Group President,
Sudatel Telecom Group

2019 is over! We are now looking to the future - and planning how we can best serve our customers across Northern Africa.

Telecom operators across Africa share common challenges and issues that we all have to deal with it to sustain and grow our business. How we adjust to the ongoing digital disruption and constantly changing technology stack are challenging issues for everyone involved in this industry but they also come with a set of promising opportunities if we get it right.

One challenge for us – and other operators in our region - is recruiting the specialist talent we need. Internally, I am always pro-actively engaging with the Sudatel team across North Africa as I recognise that their hard work and commitment will be essential in helping us to grow.

After the historical political change that took place in Sudan in 2019, everyone at Sudatel is looking forward to living in a region that is more stable and ready to embrace the technology that can help improve all of our lives.

For me, of course, becoming CEO and Group President of Sudatel Telecom Group in 2019 was a career high and I hit the ground running preparing our strategy to spearhead further expansion and growth across our footprint.

As well as Sudan, we are currently providing both mobile and fixed (voice and data) services to businesses, residents and ISPs in Mauritania and Senegal, as well as the provision of wholesale services to international carriers.

Sudan, Mauritania and Senegal are countries with very different cultural, social and economic situations. However, moving towards a digital life is a desire that is shared by the people and businesses of all three countries.

We will be investing in our activities across

the ecosystem. The expansion of our fibre network is vital in delivering reliable and speedy connectivity and providing a platform to roll out innovative digital partnerships to deliver rich infotainment and smart cloud-based services to our customers.

Network coverage will continue to grow across the whole continent; more people will get online; we will finally find a commercial and sustainable business model to Connect the Unconnected.

In addition, we will see different digital trends pick up across multiple segments. For consumers, we believe that Fintech services and digital entertainment content such as gaming, video, music, and education will start to flourish – and we are actively evolving our product portfolio to meet future demand.

For the Government segment, e-Government and Smart City services are of interest as they directly impact on the performance of the Government and make interaction with residents easier. Sudatel - as the largest infrastructure provider in Sudan - is expected to play a pivotal role in supporting the Government achieve its digital goals.

SMEs and large businesses will be demanding more cloud services and some of the IoT vertical services. We will continue to invest in our award-winning Data Centre which has been a cornerstone in the company's transformation into a full ICT player.

Finally, digital start-ups are a very interesting segment and we feel a great responsibility toward enabling them to grow and materialize their promising ideas. We are actively engaged with some of the key incubation and start-ups hubs and looking forward to adding value to this community.

Katie Hill, sustainable infrastructure, technology and renewable energy expert, global director, business operations, Africa Data Centres

As the 4th Industrial Revolution takes shape, Africa can harness new technologies to both support sustainable development and capitalise on new market opportunities.

With Africa particularly vulnerable to the impacts of climate change, most African governments have committed to global efforts to mitigate climate change. At the same time, the continent has a burgeoning young population and an urgent need to drive economic growth. Clearly, African economic and industrial development should not exacerbate climate change and further threaten vulnerable communities across the continent.

The solutions to this conundrum lie in renewable energies, sustainable water management, smart new infrastructure and agriculture models, and advanced technologies that optimise every resource.

Katie Hill, a sustainable infrastructure, technology and renewable energy expert and Global Director of Business Operations at Africa Data Centres, says sustainable growth is a concern for both public and private sector in Africa.

"All stakeholders recognise that we do need to be proactive to mitigate climate change. But Africa remains a small part of global emissions today, so it's a fine balance between mitigating climate risk, while alleviating poverty and stimulating economic growth," she says.

"There is a mix of focus from the private sector - most large multinational companies are concerned about environmental impact and sustainability, while many smaller homegrown businesses are not as environmentally aware. But we see a lot of interesting development in renewable energy, waste management and environmentally-friendly transport systems, for example, which both boost economic development and mitigate climate change."

Power is fundamental to Africa's development, but at the same time electricity and fuel are the biggest drivers of carbon in the world: "Africa is still struggling with huge energy deficit and even those on the grid have unstable access. So, capacity must be increased without increasing carbon consumption."

It is achievable. Some countries, like Kenya, have increased their use of renewable power resources to around 90%. Other East African countries, such as Ethiopia, also have very high renewable energy penetration. "This has become a huge asset for them, as international investors are drawn to clean, stable economies," she says.

Civil society is also putting pressure on private and public sector to become more environmentally friendly; and advances in technologies are helping make clean technologies more cost effective. "In energy, for example, renewable resources like solar and wind are not available 24/7, so storage is required, which has proved expensive in the past. But progress has been made in bringing down the cost of storage, so we are at a stage now where we can deploy large amounts of renewables onto the grid," says Katie.

Despite emerging market cost sensitivities and the upfront investment needed for renewable energy, many renewable energy sources are more affordable in the long term. Africa Data Centres, part of the Liquid Telecom Group, are proving this through harnessing advanced, clean technologies, including solar power generation at its data centres in Nairobi, Cape Town and Johannesburg.

Data centres are expected to account for a growing share of global energy, with some researchers predicting that by the year 2025, data centres will use 20% of the world's energy.

"All our data centres are supported by clean energy and carbon neutral technologies. Another focus for us is water, which will increasingly become a challenge as it's a finite resource. In our Cape Town data centre, we innovated around the water requirement for our cooling systems, using an atmospheric water generator (AWG), a water-from-air technology. We generate up to 1,000 litres of water a day for our own use and we are also able to distribute the excess water generated to low income schools in the community," says Katie.

"There is so much companies can do if they simply think responsibly and creatively about how they operate. Environmental responsibility is also good for business, with many opportunities to save money, although sometimes it does require some headspace to find a business case."

To find out more about how the Fourth Industrial Revolution is impacting Africa, read Liquid Telecom's latest report: *www.liquidtelecom.com* ■

"Africa is still struggling with huge energy deficit and even those on the grid have unstable access. So, capacity must be increased without increasing carbon consumption"

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