



Africa Telecoms Infrastructure in 2017

Welcome to the 4th annual review of telecommunications infrastructure development in Africa. This is the first year I have managed to get the Africa Telecoms Infrastructure Review out in a truly timely manner, perhaps that bodes well for my taxes too. The review contains links to **140** news articles on telecom development in Africa in 2017.

Undersea Cables

The development of African undersea fibre cables has something in common with American politics in that there are only so many times you can say “I can’t believe this is still happening” before it becomes mundane and annoying. In the case of undersea cables though, it is great news. New cables continue to be announced. Announcements included the Pakistan East Africa Cable Express (PEACE) cable which promises to link Pakistan with East Africa; the IOX cable which will connect South Africa with India via Mauritius, Rodrigues, and Reunion; the Australia West Express (AWE) cable which will link Djibouti with Australia; and, the FLY-LION3 cable, announced by Orange which will connect Mayotte with Grand Comore.

In terms of previously announced projects:

- the AAE-1 cable, which links Europe and Asia with landing points in Egypt and Djibouti, went live in June of 2017;
- the long-awaited ACE cable extension down to South Africa is finally under construction;
- both the South Atlantic Cable System (SACS) connecting Angola to Brazil and the Djibouti Africa Regional Express (DARE) cable connecting Djibouti with Kenya via Somalia passed a number of critical milestones in 2017;
- on the slightly more speculative front, the South Atlantic Inter Link (SAIL) cable linking Cameroon with Brazil also appears to have passed some key

milestones and the South Atlantic Express (SAEx) cable apparently signed an MOU with the island of St Helena;

- notable by their absence in 2017 news are the Africa-1 cable, the LiquidSea cable, and the Gulf to Africa (G2A) cable, all of which featured in 2016 but have not been heard of since.

All of these cables are long-term bets by governments and operators on the growth of demand for data in the regions. In general this is great news for Internet users in Africa. More cables and landing points mean more competition and lower prices. Whether or not the investors can sustain them and make a profit from them is a somewhat moot point for the consumer because, once the fibre is laid, someone is likely to continue to operate it.

One trend that is clearly visible in 2017 is the strategic investments by a number of African countries toward becoming regional hubs for Internet traffic. We have already seen that happen with economic hubs like South Africa, Nigeria, Kenya and Ghana to some degree. The last year has seen smaller countries looking to shift the focus. Djibouti in particular seems to be making a big play to become a significant East-West nexus point for cables. Already host to the EASSy, Seacom, EIG, and SEA-ME-WE cables 3 and 5; the news this year of AAE-1 going live and plans for the DARE and PEACE cables landing makes the tiny country of Djibouti a massive nexus point for the Internet. On the east coast of Africa, Cameroon seems to be making a similar move. Currently the WACS, SAT3, and the NCSCS cable land there but with the proposed ACE landing and the planned link to Brazil through the SAIL cable, Cameroon clearly intends to position itself as a hub although the relatively low state of telecommunications network development and competition in the country makes this a bit of a surprising play. Angola too seems to be strategically positioning itself with the SACS cable link to Brazil.

African Undersea Cables in 2017

News	Undersea Cable	Date
Djibouti Telecom and TSubCom DARE contract comes into force	DARE	21-12-2017

News	Undersea Cable	Date
Survey starts on Chinese-backed Peace cable from Pakistan to Kenya, Egypt and South Africa	PEACE	10-11-2017
South Atlantic Cable System begins the deep-water installation	SACS	06-11-2017
New subsea route between US, India via Brazil, South Africa	IOX	06-11-2017
New submarine cable to connect to SA in 2019 - TechCentral	IOX	26-10-2017
St Helena signs MoU for link to South Atlantic Express cable, set to receive submarine cable by early 2020	SAEx	27-10-2017
Funding settled for PEACE submarine cable project - Lightwave	PEACE	17-10-2017
Cable Compendium: a guide to the week's submarine and terrestrial developments	ACE, ELLALINK	13-10-2017
IOX Cable signs up Mauritius Telecom as subsea anchor tenant	IOX	25-09-2017
AAE-1 submarine cable enters service	AAE-1	27-06-2017
Djibouti and Somalia to share submarine optic fibre	DARE	24-08-2017
Ceiba 2	CEIBA-2	31-05-2017
Guinea Bissau reaches \$47 million deal on submarine cable	ACE	19-07-2017
Orange signe un accord pour la construction d'un nouveau câble sous-marin très haut débit entre Mayotte et Grande Comore	FLY-LION3	12-07-2017
Advancing Digitalisation In Africa	SACS	11-07-2017
China Breakthroughs: SAIL ahead on South Atlantic cable network	SAIL	07-05-2017
The AAE-1 subsea cable system enters service	AAE-1	29-06-2017

News	Undersea Cable	Date
Huawei signs South Atlantic Inter Link subsea cable contract	SAIL	28-06-2017
IOX Cable and ASN to build 8,850km subsea system	IOX	01-06-2017
Africa-Americas Undersea Cable Nears Completion	SACS	19-04-2017
Brazil-Africa fiber cable project makes progress	SACS	03-03-2017
Djibouti Telecom Announces it will Invest in Australia West Express (AWE) Submarine Cable System	AWE	12-01-2017

Terrestrial Backbone Fibre

The development of terrestrial fibre optic infrastructure on the continent continues apace with the Chinese government, the World Bank and the African Development Bank leading as the principal financiers of these networks. Huawei continues to dominate the terrestrial fibre business in Africa. No other name is seen remotely as often as theirs linked to the construction of a terrestrial fibre network on the continent. Power grid operators continued to get into the game with Kenya's KETRACO and Malawi's ESCOM featuring in 2017.

Perhaps what is most notable in 2017 are moves by both Google and Facebook on the terrestrial fibre front. Google spun off its [Project Link](#) initiative into a fully-fledged independent company called [CSquared](#), with joint investment from Google, IFC, South Africa's Convergence Partners, and Mitsui & Co. The creation of a regional wholesale fibre optic operator focused on metro network development is great news. CSquared operates metro fibre networks in Kampala, Uganda and Accra, Ghana and are about to break ground in Monrovia, Liberia. There are rumours that Maputo, Mozambique might be a fourth destination. This should be good news for both broadband speeds and competition wherever they land. More surprising news was Facebook's announcement that they are investing in a fibre optic cable in Northern Uganda along with [BCS](#) and [Airtel](#). BCS and Airtel already operate significant fibre networks in Uganda but what Facebook is doing with this investment is something that they have yet to reveal. My best guess is that this represents an exploratory move into the terrestrial fibre

market in Africa but does not (yet) have any sort of strategy behind it.

Trying to [accurately map](#) the development of terrestrial fibre is a challenge. A single cable can have multiple owners making it difficult to be sure whether there is one cable or multiple cables in a given region. Worse, operators often engage in “capacity swaps” in which they trade some of their capacity on a cable they own or partly own with another operator’s cable capacity. This is great for operators in terms of extending their network and building resiliency through multiple routes but is a real conundrum when trying to figure out who owns a particular physical stretch of cable.

In the last two years I have attempted to sum up the amount of investment and kilometres of fibre announced in the preceding year. This year I have found the news too vague on both fronts to make it worth doing.

African Terrestrial Fibre Projects in 2017

Country	Kilometres	Investment (\$M)	Date	Financing	Contractor/Operator
West & Central Africa			19-12-2017		Angola Cables
Burkina Faso (rel rel)	2001	91	11-12-2017	Bank of China, BNP Paribas	Huawei
Mali					
Gabon	520	27	01-12-2017	World Bank	Huawei
Pan African	200,000	10,000	09-03-2017		China Communications Service Corp. Ltd
Mozambique			24-11-2017		CSquared
Nigeria	18,000		09-11-2017	Gov't of Nigeria	
Burkina Faso	180		13-11-2017	World Bank	
Kenya		5.8	07-11-2017		Telkom Kenya

Country	Kilometres	Investment (\$M)	Date	Financing	Contractor/Operator
Kenya (rel rel)	11,000	3,500	23-10-2017	Kenya Electricity Transmission Company (Ketraco)	Liquid Telecom Kenya
Malawi (rel rel)		23	17-07-2017	Electricity Supply Corporation of Malawi (Escom)	Huawei
Uganda					
Zimbabwe					
Zambia		55	02-06-2017	MTN	MTN
Kenya	capacity upgrade		05-09-2017		Liquid Telecom
SouthAfrica					
Kenya					
Tanzania					
Uganda, Tanzania				African Development Bank	
South Africa		100	30-05-2017		Dark Fibre Africa
Cameroon, CAR, Congo, Nigeria					
Uganda	770		08-03-2017	Facebook, Airtel, BCS	Airtel, BCS
Zimbabwe			04-04-2017	China Exim Bank	TelOne
South Africa					
Uganda	765		20-09-2017	Government of China	Huawei

Country	Kilometres	Investment (\$M)	Date	Financing	Contractor/Operator
Cameroon: Optical fiber was extended by 4,000 km in 2017, to reach 12,000 km	4000		11-12-2017		
Hurricane Electric expands global network to East Africa Data Centre in Nairobi			12-10-2017		

Fibre To The Home and Video on Demand (VoD)

Demand for video streaming services like Netflix (and an increasing number of African competitors) grew significantly in 2017. This has spurred demand for Fibre To The Home (FTTH) services capable of handling multiple media streams. Or perhaps it is the other way around. FTTH is growing faster than anyone imagined. A number of factors are contributing to this:

- the growth of undersea and terrestrial fibre optic networks is bringing vast capacity to metro centres;
- streaming services like Netflix are a growing phenomenon globally;
- the digital switchover which should have seen a transition from analogue to digital terrestrial broadcasting is incomplete in most African countries and doesn't appear to be building the expected market for terrestrial broadcast services;
- cost of deployment of FTTH networks is dropping; and,
- there are a host of devices from tablets to phones to set-top boxes that can host streaming content once it is in the home.

That alone might be enough to be a perfect storm for digital terrestrial

broadcasting but satellite broadcasting services are growing and offering more competition in this space as well. At the pace streaming services are growing, the fortunate countries might turn out to be those who still haven't gotten around to the digital switchover.

African FTTH and VoD Announcements in 2017

News	Country	Date
Zeop covers 60% of Reunion with FTTH	Reunion	29-11-2017
Sénégal: Lancement officiel de la fibre optique - Sonatel/Orange rend visite à sa 1ère cliente fibrée - allAfrica.com	Senegal	22-11-2017
www.zte.com.cn/global/about/press-center/news/201710ma/1025ma2	Algeria	17-10-2017
Safaricom kicks off FTTH regional roll-out Internet News in Kenya	Kenya	11-10-2017
Zuku TV set to launch Unlimited home internet in Uganda : Check out pricing details and more -	Uganda	02-10-2017
High speed fibre Internet connections double to 54,700 - Business Daily	Kenya	02-10-2017
Safaricom says 81,000 homes linked to its fibre - Business Daily	Kenya	03-09-2017
Vumatel to offer 100Mbit/s uncapped home fibre in townships for R89/month - TechCentral	South Africa	01-09-2017
Safaricom to adopt Huawei's E2E FTTH solution	Kenya	25-08-2017
Seacom acquires MacroLan to extend fibre reach - ITWeb Africa	South Africa	07-08-2017
KETRACO seeks telecoms operator partners for fibre network rollout	Kenya	31-03-2017
CST doubles fibre network speeds to 200Mbps	São Tomé & Príncipe	05-04-2017
Afrihost claims to have tripled fibre coverage	South Africa	14-02-2017
Vodafone Ghana launches Fibre Broadband - BusinessGhana News Business	Ghana	11-02-2017
Vivendi granted Gabonese FTTH licence	Gabon	25-01-2017
Kwese TV partners with Liquid Telecom to roll-out Kwese Play and Roku Internet TV in Uganda	Uganda	20-09-2017

News	Country	Date
Cell C Black - The future of entertainment	South Africa	01-11-2017

Licensed Spectrum

Making licensed spectrum available has proven an ongoing challenge for regulators on the continent. In April I wrote about the [results of recent of spectrum auctions on the continent](#), outlining the challenges they have faced. Conventional wisdom is that auctions are the fairest mechanism for making high-demand spectrum available to the market. This may be true, at least in theory, but the reserve prices being set by governments are directly undermining that aim. The lure of a quick hit to the treasury is eclipsing the more strategic, but longer term, agenda of making access more pervasive and affordable.

Ghana auctioned 800MHz spectrum in 2016 but only MTN was willing to pay the reserve price and spent \$64M acquiring that spectrum. The regulator has since announced their intention to re-auction the rest of the spectrum but MTN have insisted (and the regulator has acquiesced) that anyone acquiring 800MHz spectrum must match the price that they paid. Vodafone has spent much of 2017 trying to negotiate some sort of compromise with no success to date. A similar situation exists in Nigeria with MTN and 2.6GHz spectrum.

The one country making real progress in the assignment of new spectrum is Kenya. They have avoided auctions entirely. The Kenyan regulator has assigned several spectrum licences in both the 800MHz and 700MHz bands in the last two years. The downside of this approach is a lack of transparency on how the winners are chosen which has provoked complaints from operators. The upside is that the spectrum is being used, now.

Angola announced an auction of 800MHz spectrum which was to have taken place in August of 2017. Since the announcement there has been no news of either progress or outcomes of the auction.

South Africa remains mired in acrimonious debate over the government's plan to create a Wireless Open Access Network (WOAN). Using new and existing spectrum bands, the WOAN is envisage to be a wholesale wireless network that operators would be expected to use to deliver service. The idea behind the

WOAN is to have operators compete on services not infrastructure. National wholesale wireless networks are a relatively untested strategy with only Rwanda and Mexico having implemented them. The jury is still out on Mexico but Rwanda's network cannot be declared a success as prices remain high and usage limited. This doesn't mean that WOANs are a bad strategy but South Africa's "all-in" approach may not be the best way of finding out.

I find myself very sympathetic to the strategies being pursued by both Kenya and South Africa because it seems clear to me that auctions create perverse incentives for governments, especially cash-strapped ones. The chair of the Australian regulator, Rod Sims, hits the nail on the head when he says:

the value of spectrum lies in the economic and social benefits it can provide to citizens and consumers, not in financial returns to the Budget.

Countries stand to benefit far more both economically and socially from more pervasive and more affordable communication than from any treasury windfall from a spectrum auction but that takes a longer term view that most politicians seem willing to embrace.

African Spectrum Auction News in 2017

Country	Date	News	Frequency
Kenya	11-05-2017	Kenya's CA Awards JTL 4G Frequency Spectrum on Questionable Terms	700MHz
Kenya	07-12-2017	Kenya, Chinese firms partner to launch faster, cheaper internet	700MHz
Nigeria	15-11-2017	2018: NCC Targets 30% Broadband Penetration With New Spectrum Auctions	700MHz, 2.5GHz, 2.6GHz
Ghana	07-09-2017	NCA Gives Opportunity to Telcos to Deploy 3G Coverage to Rural Areas » National Communications Authority	900MHz
Tanzania	09-11-2017	Airtel sets for massive network transformation	900MHz

Country	Date	News	Frequency
Nigeria	12-11-2017	NCC plans new spectrum auctions	700MHz
Ghana	11-09-2017	Rural areas to receive improved 3G through 900MHz rollout	900MHz
Ghana	05-09-2017	Vodafone in 'constant' talks with NCA over 4G licence - CEO	800MHz
Kenya	31-08-2017	Heavy debt load leaves Airtel in Sh8 billion loss	800MHz
Angola	26-07-2017	Inacom anuncia as datas para o seu primeiro leilão de frequencias	800MHz
Angola	25-07-2017	Inacom marks the first auction	800MHz
Angola	28-07-2017	Angola launching open frequency auction for the first time; 800MHz applications due in August	800MHz
Ghana	20-07-2017	Ghana's govt rejects calls for 4G license price slash	800MHz
South Africa	14-07-2017	Gigaba's action plan for spectrum	700MHz, 800MHz, 2.6GHz
Ghana	10-07-2017	Cost of 4G spectrum won't be reduced - Ursula to telcos	800MHz
Kenya	10-05-2017	CA gives company multibillion-shilling licence	700MHz
Nigeria	10-05-2017	Nigeria's tech regulator takes on unlicensed spectrum users	5GHz
South Africa	12-02-2017	Icasa defers spectrum auction indefinitely	800MHz, 2.6GHz
South Africa	09-02-2017	Cell C wants Vodacom and MTN to give back spectrum	2.1GHz, 2.3GHz
Kenya	06-01-2017	Safaricom pays USD25m for 4G licence	800MHz

Country	Date	News	Frequency
Kenya	04-01-2017	Safaricom pays Sh2.5bn fees for high-speed Internet band	800MHz
Nigeria	03-01-2017	Why telcos may shun spectrum auction	2.6GHz

LTE networks continue to spread as operators upgrade their infrastructure. Network announcements this year have been notable in their failure to mention what spectrum bands are being used by the operators. I can only imagine that this is being treated as technical information that is not of interest to readers as opposed to the strategic information that it represents. Knowing whether new bands are being utilised or existing bands re-purposed is essential to understanding the evolution of the market and competition yet it rarely seems to get reported. Unlike previous years I am unable to give a breakdown of which frequencies have proven most popular.

African LTE Network Launches & Expansions in 2017

Country	Operator	Type	Date	LTE
Zambia	Airtel	Launch	19-12-2017	LTE
Kenya	Safaricom	Expansion	10-12-2017	LTE
Kenya	Jamii Telecom (rel rel)	Launch	07-12-2017	LTE
Madagascar	Airtel	Launch	20-11-2017	LTE
Uganda	Airtel	Launch	22-09-2017	LTE
Uganda	UTL	Launch?	09-10-2017	LTE
Nigeria, Uganda, Tanzania, DRC	Smile	Upgrade	16-11-2017	VoLTE
Zambia	Zamtel	Expansion	02-11-2017	LTE
Egypt	Vodafone, Orange (rel)	Launch	25-09-2017	LTE
Reunion	Telco OI	Expansion	13-09-2017	LTE

Country	Operator	Type	Date	LTE
Malawi	TNM	Expansion	31-08-2017	LTE
Cameroon	Vodafone	Expansion	01-09-2017	LTE
Zimbabwe	Telecel (rel)	Launch	24-08-2017	LTE
Sudan	Sudatel	Expansion	06-04-2017	LTE-A
Botswana	BTC	Launch	10-04-2017	LTE
Zimbabwe	Telecel	Launch	25-08-2017	LTE
Burundi	Econet Leo	Expansion	08-01-2017	LTE
Botswana	Botswana	Launch	10-04-2017	LTE
Libya	Libyana	Launch	28-03-2017	LTE
Kenya	Airtel	Launch	27-01-2017	LTE
Rwanda	Rwanda	Expansion	08-01-2017	LTE
Algeria	Ooredoo	Launch	10-01-2017	LTE

Unlicensed and Dynamic Spectrum

WiFi networks, whether commercial, government, or community, have continued to grow at a rapid pace on the continent. Both governments and network operators are realising that wherever they have high-speed backhaul networks, it is a small marginal cost to add WiFi access points at key points on those networks. The fact that WiFi is unlicensed (but not unregulated) combined with its performance and low-cost have made this an obvious access technology choice in countries where gaining access to licensed spectrum remains a challenge. What remains to be seen is what business models prove to be most successful for WiFi networks. In South Africa, [Project Isizwe](#) is evolving from a government-funded non-profit to an advertisement-driven model. Ad-driven revenue appears to be the principal alternative to straight pay-for-access models although some networks, like [Surf WiFi](#) in Kenya are doing both. In the Eastern Cape in South Africa, [Zenzeleni Networks](#) have established the first telecommunications cooperative in the country. In Rwanda, African Renewable Energy Distributor ([ARED](#)) are attempting to combining solar-power energy services and WiFi.

Facebook have also gotten into the WiFi space on the continent in a big way with their [Express WiFi program](#). Both Tizeti in Nigeria and Surf WiFi in Kenya

announced partnerships with Facebook in 2017 to roll out Express WiFi hotspots. You may be wondering just what is Express WiFi. Their website is remarkably parsimonious with information about it. In short, it is an agent platform for WiFi operators that manages sign-up, revenue generation and sharing for Express WiFi agents. ExpressWiFi relies on an existing Wireless ISP (WISP)'s network but it also brings investment to help the WISP expand its network. For example, Surf WiFi operate their own agent network as well as an Express WiFi network in Kenya. It may not sound that exciting but this is where the battleground for WiFi will be fought with the management platforms and agent networks that enable WiFi networks to scale. Microsoft, too, have been busy with their [Airband Initiative](#) which provides seed funding to promising energy and connectivity startups. Both [C3](#) in Malawi and ARED in Rwanda have received support through this program.

There are signs of consolidation as well as Project Isizwe's parent organisation HeroTel acquired its 25th WISP in November. As more proven successful business models emerge, expect more consolidation to happen.

With TV White Space (Dynamic Spectrum) technologies, things are more frustrating. Dynamic spectrum remains an extremely promising technology, especially for rural service delivery in African countries where the spectrum is relatively unoccupied. But regulators have been reluctant to take the bold step of formally establishing regulations allowing dynamic spectrum deployments. This uncertainty sends the wrong signals to manufacturers who should be churning out dynamic spectrum devices in the hundreds of thousands by now. Bright spots this year include Malawi where the regulator, while stopping short of formal regulations, has allowed startup C3 to use TVWS spectrum and Rwanda, where the regulator has carried out a successful pilot and made positive noises about introducing regulation. Also, Microsoft, a tireless supporter of dynamic spectrum has partnered with UK domain name registrar, Nominet, to deploy more TVWS networks on the continent.

African WiFi & Dynamic Spectrum News

in 2017

Country	Technology	Date	News
Nigeria	WiFi	21-12-2017	Tizeti Network Limited selects Cambium Networks wireless broadband connectivity solutions total telecom
Nigeria	WiFi	11-12-2017	MainOne links with Facebook, Tizeti on internet connectivity project
South Africa	WiFi	23-11-2017	Holding out for a hero: HeroTel acquires another regional ISP
South Africa	WiFi		toomuchwifi
Regional	WiFi	10-11-2017	Konnnect Africa brings Wi-Fi to rural African communities
Nigeria	WiFi	08-11-2017	AfricaCom 2017: Tizeti and Facebook to expand Wi-Fi express in Nigeria
SouthAfrica	WiFi	28-07-2017	Low-cost comms co-op Zenzeleni Networks provides cheaper voice and data for village community
Nigeria	WiFi	26-06-2017	Nigerian Tech Startup Tizeti Secures \$2.1M To Bring Affordable Wireless Internet To Africa
Regional	WiFi	30-05-2017	Liquid Telecom's Wi-Fi Roaming Hub Aims to Connect African Telcos and Reduce Roaming Charges
Nigeria	WiFi	10-05-2017	Nigeria's tech regulator takes on unlicensed spectrum users
Nigeria	WiFi	15-05-2017	Free Wi-Fi in Lagos Now Available
SouthAfrica	WiFi	26-04-2017	South Africa: Over 1 million township residents to get Wifi
Kenya	WiFi	29-03-2017	Facebook launches low-cost internet service, Express Wifi, in Kenya

Country	Technology	Date	News
Mauritius	WiFi	10-04-2017	Mauritius government launches 350 new Wi-Fi zones in 20 locations nationwide
Kenya	WiFi	29-03-2017	Facebook takes on Telcos with low-cost internet
Rwanda	WiFi	10-02-2017	Rwandan solar-powered kiosk company wants to create Africa's biggest wifi network
SouthAfrica	WiFi		Ikeja Unlimited Wireless Internet at your House
Kenya	WiFi	02-01-2017	AccessKenya returns to low-cost home Internet with US partner
Kenya	WiFi	04-01-2017	Race for Internet subscribers goes to small towns as firms boost
Regional	Dynamic Spectrum	06-01-2017	Nominet and Microsoft bringing broadband to Africa via TV white spaces
Rwanda	Dynamic Spectrum	07-01-2017	Test for affordable internet shows promise, say officials
South Africa	WiFi	13-12-2017	Tshwane wi-fi talks stall
South Africa	WiFi	09-12-2017	How a remote South African rural community, with barely any electricity, built its own ISP
Malawi	Dynamic Spectrum	28-04-2017	C3 to launch a nationwide wireless data network using Mimoso, TV White Spaces and Wi-Fi - Targeting Corporates, SMEs and NGOs

Satellite

Intelsat [launched Intelsat 37e](#) in 2017 offering Ku-band and C-band services over Africa. What is significant about 37e is that it is one of a new generation of High Throughput Satellites (HTS) that represent a leap forward in terms of broadband

capacity for satellite services at prices that (hopefully) are competitive with terrestrial offerings. Algeria [launched Alcomsat-1](#) which will offer Ka-band services to the country and Ku-band services to Tunisia, Northern Chad and Northern Sudan.

Summary

Undersea cables are a bellwether of network development on the continent. The expansion and upgrading of existing cables as well as announcements of new initiatives bodes extremely well for the continued rapid growth of access. Increased international capacity is a trigger for investment in terrestrial fibre network capacity so expect that trend to continue upward as well. As demand for broadband grows, fibre networks become ever more strategic elements of the Internet ecosystem. Making sure that fibre backbones are available equitably and affordably to all players will become an increasingly strategic question. I written about how that might be achieved with [state-owned fibre networks](#) but sometimes it just takes the arrival of a company with a different business model to shake things up. One of the most significant but least reported African telecom news items of 2017 was the arrival of global IP backbone company, Hurricane Electric (HE), in Kenya. By establishing a Point of Presence (PoP) in Nairobi, customers can connect directly in to HE's massive global Internet network at prices that are shaking up the East African market.

Beyond affordable and accessible backhaul networks, the key to network growth on the continent is access to wireless spectrum. Spectrum auctions are notoriously hard to run well and often don't run at all if the reserve price is set too high. Where they do work, they tend to benefit the incumbents who have the deepest pockets. The lack of progress across the continent in 2017 in making spectrum available is a sign that new strategies should be explored. Whether a WOAN or dynamic spectrum or something new, regulators need to diversify their regulatory strategies in the same way that investors diversify their portfolios to mitigate risk. The continued rapid growth of WiFi networks across the continent are a very positive sign of the pent-up energy that is ready to invest in network development if affordable backhaul and wireless spectrum is available. Unlicensed spectrum has a very high upside but represents very little downside risk for regulators. Worth thinking about.

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