



The Mobile Economy
Sub-Saharan
Africa
2021



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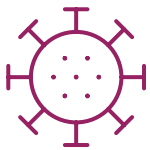
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Executive summary



Mobile industry continues to support pandemic response and recovery

The mobile industry in Sub-Saharan Africa continues to play a crucial role in the response to Covid-19. Mobile networks have become a lifeline for society during the pandemic, keeping people and businesses connected and enabling work, learning and other daily activities to continue despite social restrictions. Significant increases in the adoption and use of mobile services since the start of the pandemic, particularly mobile data and mobile money, reflect the utility of mobile technology in challenging times.

As economies recover and restrictions ease, mobile technology will be even more integral to how people live and how businesses operate. It will enable new digital solutions for small and large enterprises and support the growing use of online channels by consumers. Strong investor confidence and consumer

interest in digital platforms point to a digital-centric future for Sub-Saharan Africa, with mobile at the centre of the creation and consumption of innovative solutions.

Meanwhile, mobile operators have implemented measures to support vulnerable communities and governments' response efforts throughout the pandemic. These include offering discounts on mobile tariffs and providing digital content and tools to help people and businesses get online. As vaccination programmes begin in many countries, mobile operators have also committed funds and other forms of support to ensure the availability and efficient distribution of vaccines across Sub-Saharan Africa.



4G adoption accelerates as 3G begins to slow

4G adoption in Sub-Saharan Africa remained sluggish in the latter part of the last decade, despite 4G networks covering half the population. However, this is beginning to change as a combination of pandemic-driven demand for better connectivity and improved affordability of 4G smartphones (mainly due to innovative financing solutions) drive uptake. As a result, 3G growth is slowing rapidly, with adoption set to peak by 2023. Over the period to 2025, 4G adoption in Sub-Saharan Africa will double to 28%, compared to a global average of 57%.

It is still early stages in the journey to 5G in Sub-Saharan Africa; as of June 2021, there were seven commercial 5G networks in five markets across the region. 5G will play an important role in the future digital landscape, enabling advanced connectivity solutions for the consumer and enterprise segments. However, the immediate focus of the industry will continue to be on 4G, which still has significant room for growth in Sub-Saharan Africa. By the end of 2025, 5G will account for 3% of total mobile connections in the region.



Youthful population sustains subscriber growth

By the end of 2020, 495 million people subscribed to mobile services in Sub-Saharan Africa, representing 46% of the region's population – an increase of almost 20 million on 2019. With more than 40% of the region's population under the age of 15, young consumers owning a mobile phone for the first time will remain the primary source of growth for the foreseeable future. There will be around 120 million new subscribers by 2025, taking the total number of subscribers to 615 million (50% of the region's population).

At the end of 2020, 303 million people across Sub-Saharan Africa were connected to the mobile internet, equivalent to 28% of the population. With digital services set to be at the heart of a post-pandemic world, the urgency to bring unconnected communities online, particularly vulnerable groups such as women, has never been greater. Several operators in Sub-Saharan Africa have implemented initiatives to improve digital inclusion for women. By 2025, more than 170 million people across the region will have started using mobile internet for the first time, taking the penetration rate to just under 40% of the population.



The mobile industry continues to contribute to economic growth and social progress

In 2020, mobile technologies and services generated more than \$130 billion of economic value added (8% of GDP) in Sub-Saharan Africa. This will reach \$155 billion by 2025, as countries increasingly benefit from the improvements in productivity and efficiency brought about by the increased take-up of mobile services. Mobile money in particular is driving productivity; in 2020, the value of transactions on mobile money platforms in the region reached \$490 billion.

In April 2021, the mobile sector was credited by the United Nations (UN) for achieving a critical breakthrough towards its mission of combatting climate change. Being the first major sector to achieve the rigorous criteria set by the UN's Race to Zero campaign demonstrates the commitment and leadership of mobile operators in the drive to meet the goals of the Paris Agreement. This comes at a time when political and economic leaders are giving fresh impetus to delivering a zero-carbon world.



Policies should look to engender inclusive digital development

The pandemic has highlighted the increasing importance of digital technology to responding effectively to crises and planning for recovery. At the same time, the crisis has the potential to accelerate the continent's digital transformation and create resilient digital jobs in Sub-Saharan Africa. The continued rollout of 4G and the first stages of the 5G era open up opportunities in areas such as healthcare, digital commerce, industrial automation and smart city infrastructure.

Realising this potential requires policy measures to support network investments and improve the affordability of digital services for consumers. Governments and regulators in the region should therefore adopt forward-looking spectrum

management and fiscal policies, including the following:

- Creating a spectrum roadmap to ensure there is enough spectrum to meet surging demand for mobile services in both the short and long term.
- Ensuring access to mid-band spectrum, in particular 3.5 GHz, given its importance to the future of 5G.
- Accelerating access to sub-1 GHz spectrum to provide widespread rural mobile broadband services.
- Applying best-practice principles of taxation as recommended by international organisations such as the World Bank and the IMF.

Mobile Economy Sub-Saharan Africa

UNIQUE MOBILE SUBSCRIBERS



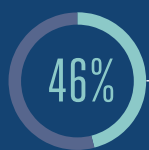
2020-2025
CAGR: 4.4%

2025

2020

495m

615m



Penetration rate
Percentage of population



SIM CONNECTIONS

(excluding licensed cellular IoT)



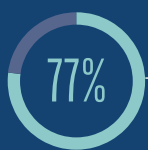
2020-2025
CAGR: 4.8%

2025

2020

930m

1.12bn



Penetration rate
Percentage of population



MOBILE INTERNET USERS



2020-2025
CAGR: 9.3%

2025

2020

303m

474m



Penetration rate
Percentage of population



OPERATOR REVENUES AND INVESTMENT

Total revenues

2020

\$44.2bn

2025

\$56.2bn

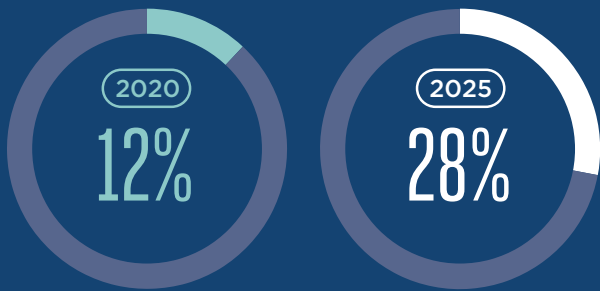


Operator capex of \$45 billion
for the period 2020-2025

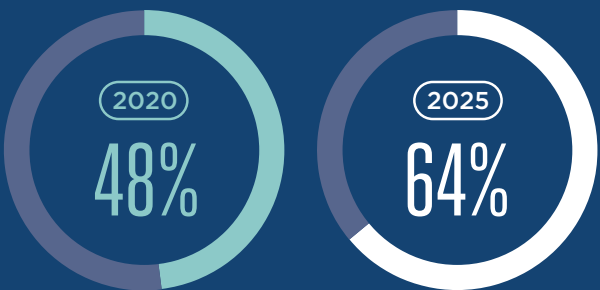
4G

Adoption

(Percentage of total connections excluding licensed cellular IoT)



SMARTPHONE ADOPTION



Percentage of connections

(excluding licensed cellular IoT)



MOBILE INDUSTRY CONTRIBUTION TO GDP



2020

\$132bn
(8% GDP)



2025

\$155bn

5G

2025

35m
Connections



3%

Adoption

(Percentage of total connections excluding licensed cellular IoT)

PUBLIC FUNDING



2020

\$15bn

Mobile ecosystem contribution to public funding

(before regulatory and spectrum fees)

EMPLOYMENT

Jobs formally supported by the mobile ecosystem in 2020

300,000

+1.1m
Informal jobs

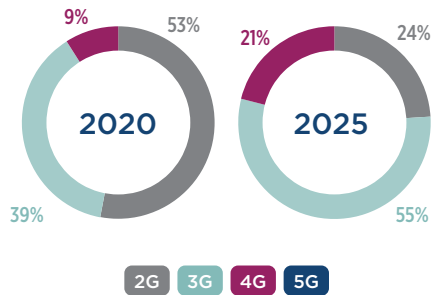


Subscriber and technology trends

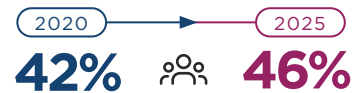
ECCAS



TECHNOLOGY MIX*



SUBSCRIBER PENETRATION



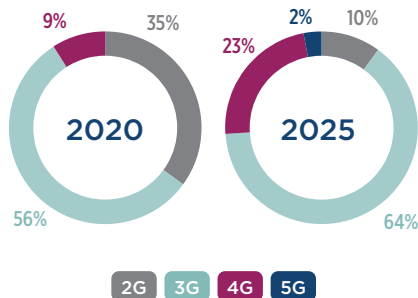
SMARTPHONE ADOPTION



ECOWAS



TECHNOLOGY MIX*



SUBSCRIBER PENETRATION



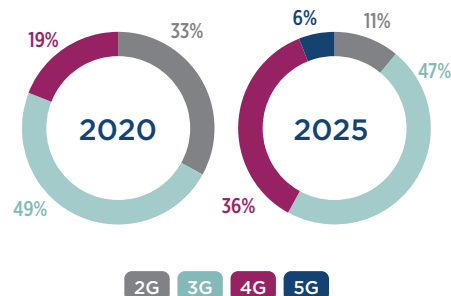
SMARTPHONE ADOPTION



SADC



TECHNOLOGY MIX*



SUBSCRIBER PENETRATION



SMARTPHONE ADOPTION

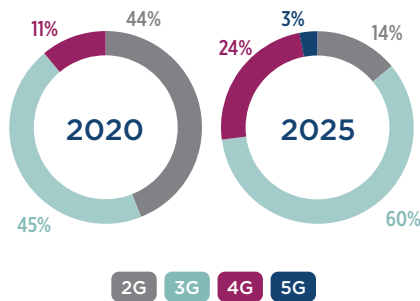


* Percentage of total mobile connections (excluding licensed cellular IoT)
Note: Totals may not add up due to rounding

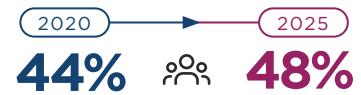
EAC



TECHNOLOGY MIX*



SUBSCRIBER PENETRATION



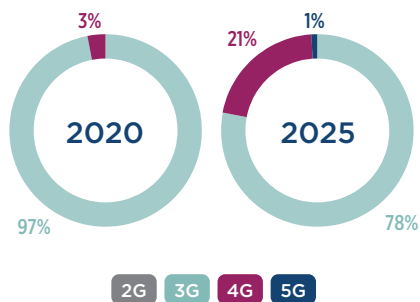
SMARTPHONE ADOPTION



Ethiopia



TECHNOLOGY MIX*



SUBSCRIBER PENETRATION



SMARTPHONE ADOPTION



A man with short dark hair, wearing a grey checkered blazer over a dark shirt, is talking on a black mobile phone. He is looking to his left with a slight smile. The background shows a brick wall and a window frame. In the bottom left corner, there is a decorative graphic of overlapping blue and purple circles.

01

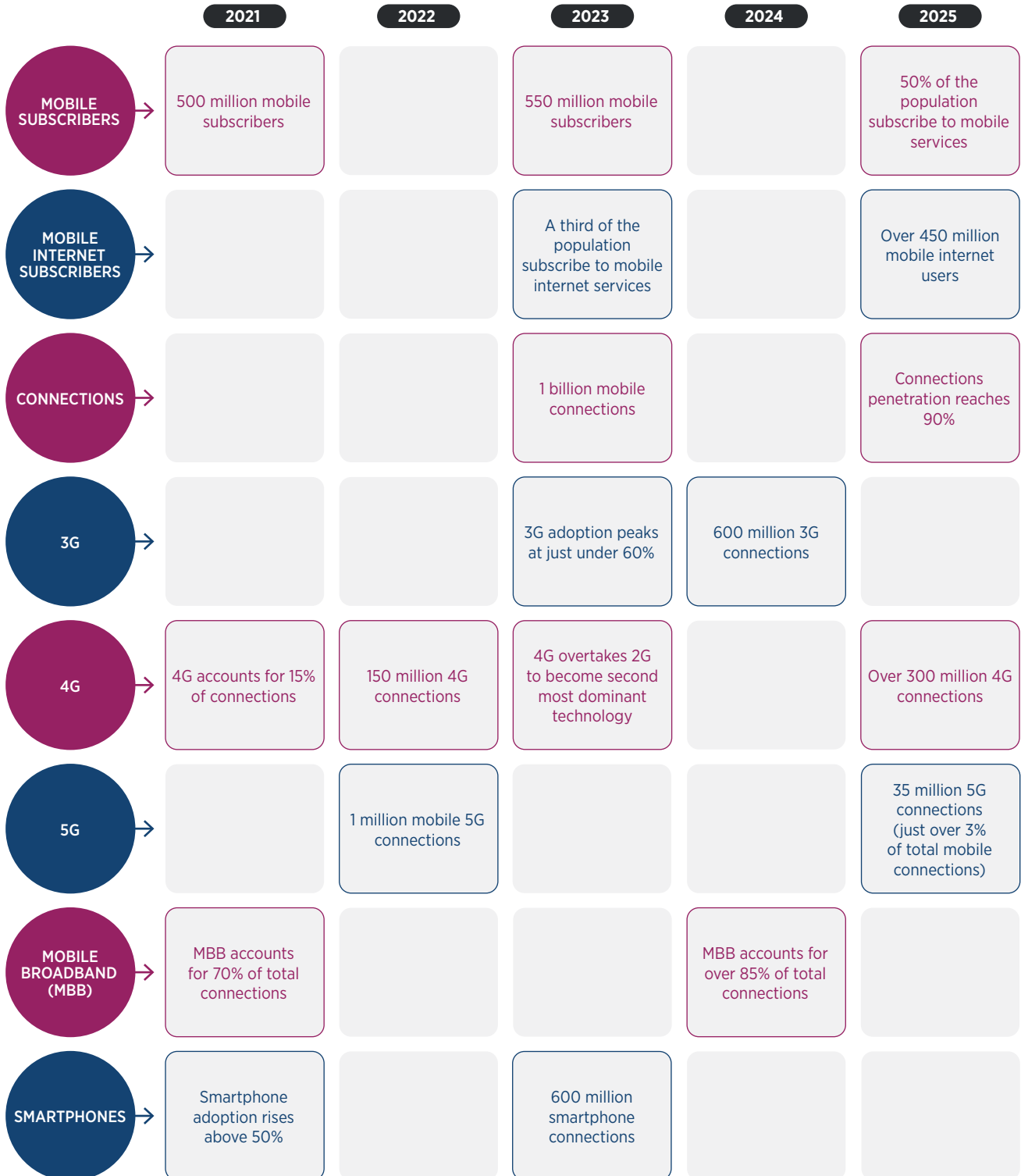
The mobile market in numbers

1.1 Mobile adoption reaches new heights

Figure 1

Source: GSMA Intelligence

Key milestones over the next five years in Sub-Saharan Africa

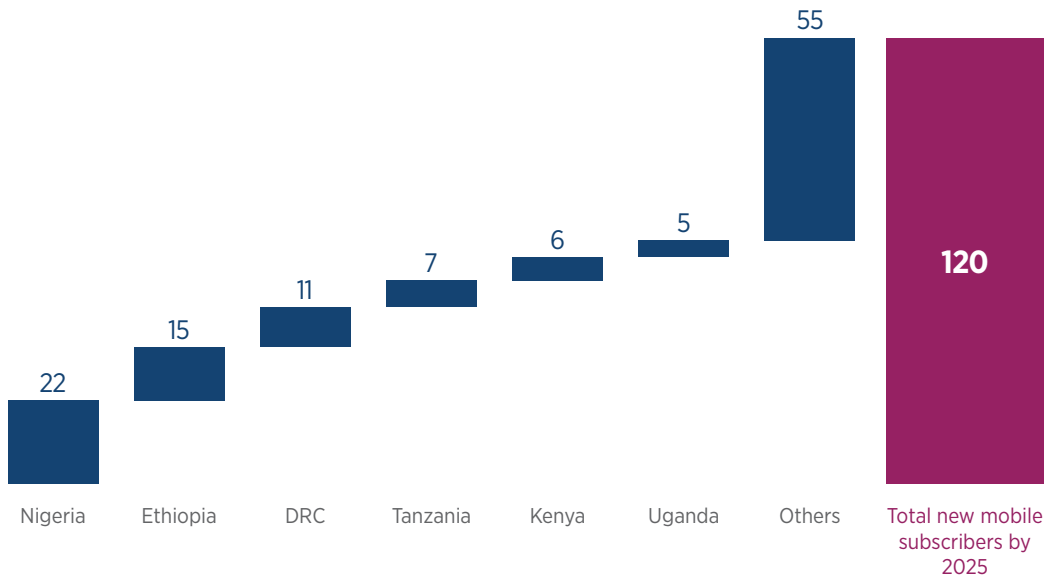


Source: GSMA Intelligence

Figure 2

In Sub-Saharan Africa, 120 million people will start using mobile between 2020 and 2025, with almost a third from Nigeria and Ethiopia

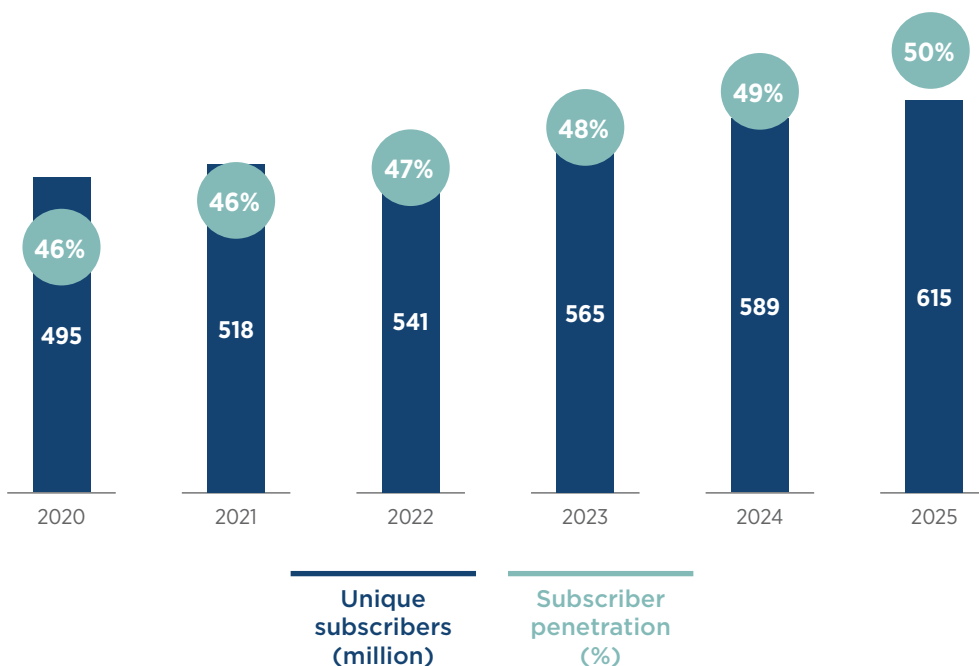
Million



Source: GSMA Intelligence

Figure 3

Unique subscriber penetration will reach 50% by 2025, mostly driven by uptake among young adults owning a mobile for the first time



1.2 4G adoption accelerates as 3G growth slows

Figure 4

Source: GSMA Intelligence

4G adoption to double by 2025, reflecting improving device affordability

Percentage of connections (excluding licensed cellular IoT)

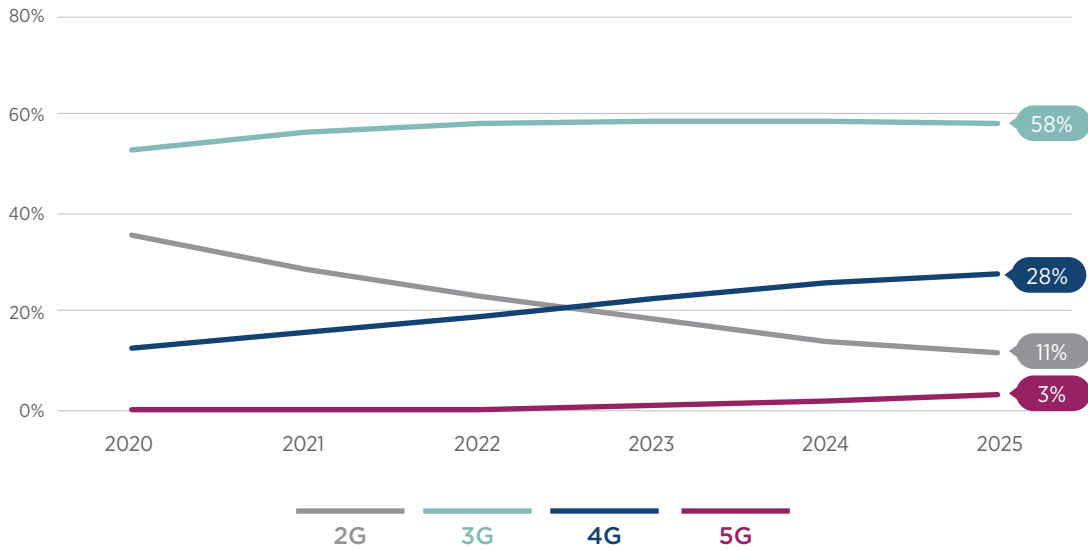
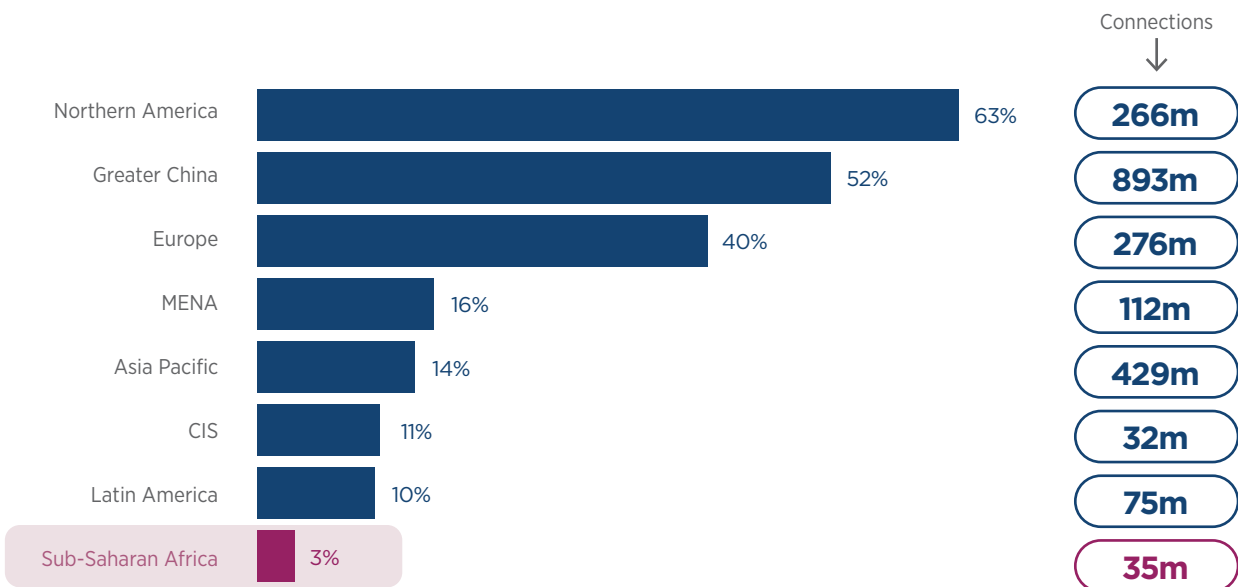


Figure 5

Source: GSMA Intelligence

5G is a longer term proposition for Sub-Saharan Africa

5G adoption in 2025 (percentage of total connections)





1.3 Consumers go digital

Source: GSMA Intelligence

Figure 6

A third of people in Sub-Saharan Africa will be using mobile internet by 2022, rising to nearly 40% by 2025

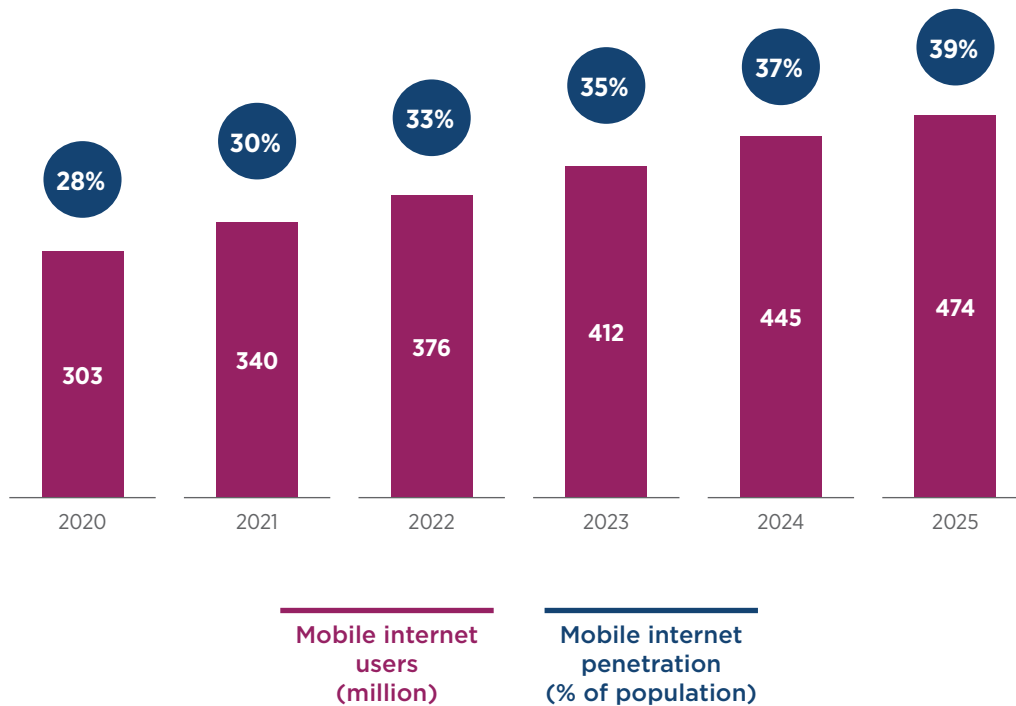
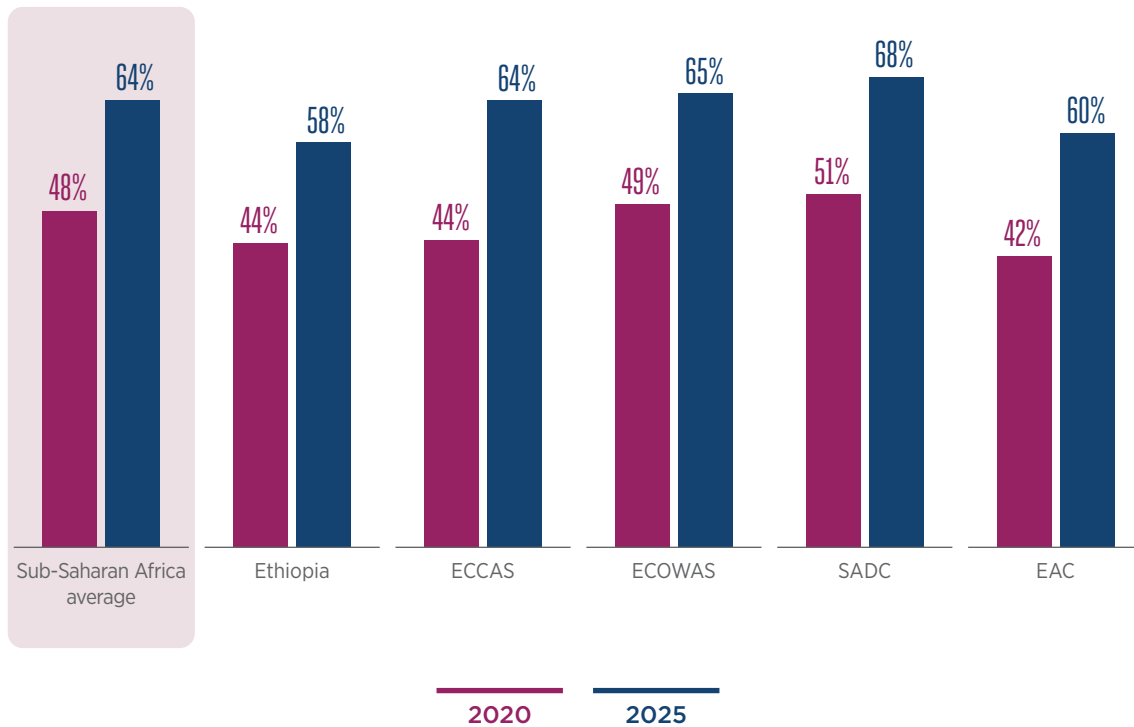


Figure 7

Source: GSMA Intelligence

Smartphones will account for almost two thirds of connections in Sub-Saharan Africa by 2025, fuelled by financing plans and more affordable devices

Smartphones as a percentage of connections (excluding licensed cellular IoT)



Smartphone connections: top three markets in Sub-Saharan Africa (2025)



Nigeria
163 million



South Africa
89 million

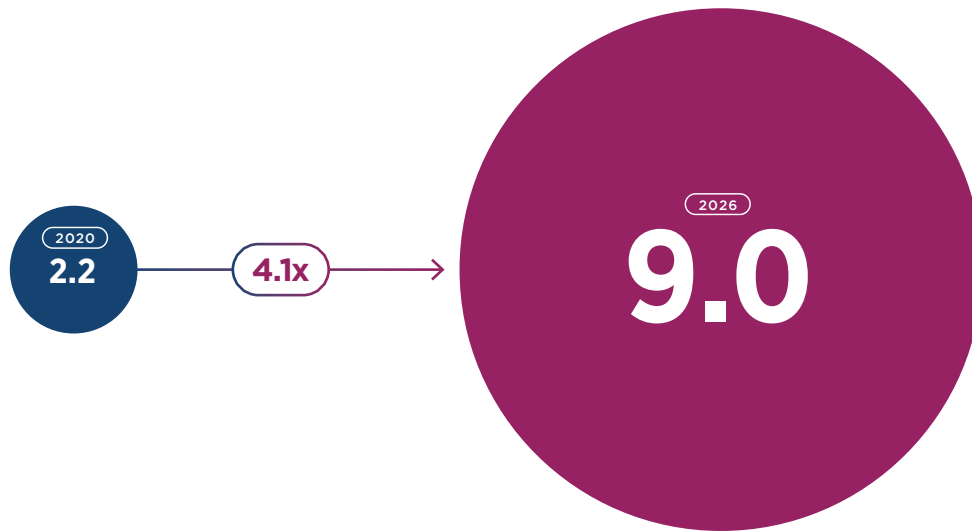


Kenya
52 million

Figure 8

Smartphone adoption and increasing digital content will spur data usage growth in Sub-Saharan Africa

Mobile data traffic (GB per subscriber per month)



The rise of online streaming services

Africa has the ingredients needed to become a major market for streaming content: a large, youthful and tech-savvy population, an outdated media and entertainment industry that is ripe for digital disruption, and rising 4G adoption. There has been a lot of activity in the streaming market over the last two years, driven primarily by local players such as Iroko and Showmax, but there has also been growing interest from global players, notably Netflix.

Netflix and Showmax have recently launched mobile-only subscription plans to tap into the increasing uptake of smartphones, especially among younger and more mobile consumers who may not have access to larger-screen streaming devices or would find the lower subscription costs more affordable. In South Africa, Vodacom recorded a 65% increase in Netflix streaming over mobile during the Covid-19 lockdown, nearly double the 36% increase over fibre.

Online streaming service providers are building distribution partnerships with mobile operators and investing in local entertainment content to increase market access and appeal to more culturally sensitive segments of the market. In May 2020, Netflix launched its 'Made in Africa' collection, a list of series, movies and documentaries shot in Africa. Netflix has also begun commissioning more locally produced shows and movies that reflect the cultures and experiences of ordinary Africans as part of its Netflix Originals portfolio.

1.4 Revenue growth remains strong in the pandemic

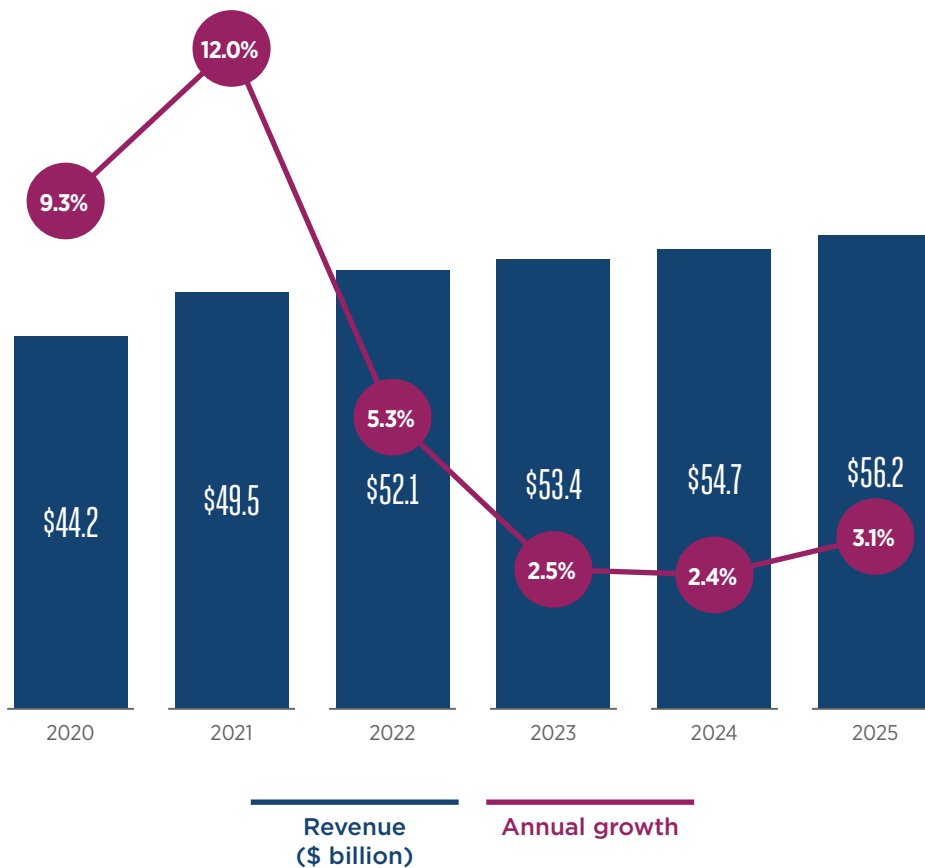
Revenue growth is benefitting from the recovery of economic activities, following disruptions caused by the pandemic in 2020. Data and mobile money remain the prime revenue growth drivers, with adoption and use of both services continuing to

rise rapidly. Beyond this, operators are seeing strong demand for a wider range of digital services, reflecting a shift in consumer behaviour triggered by the pandemic.

Figure 9

Source: GSMA Intelligence

Revenue growth remained in positive territory during the pandemic, underpinned by strong demand for mobile services



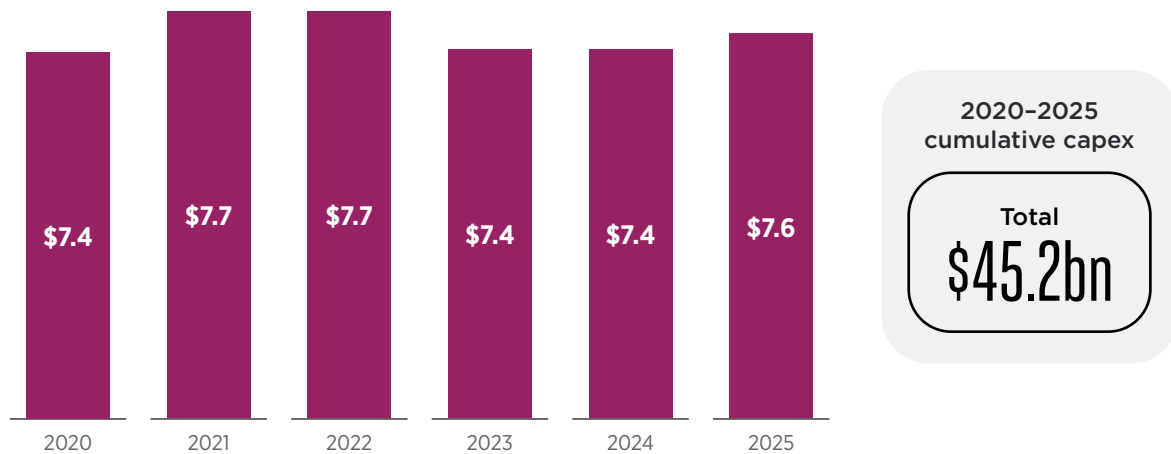
The pandemic has underscored the value of mobile networks, which remain the only form of internet access for many in Sub-Saharan Africa. Mobile networks have remained resilient as operators implemented various measures, including investments in network capacity, to cope with the

surge in data traffic. With the use of digital services likely to continue rising, operators' investments will only become more important. 5G will be a major part of this investment as commercial services are deployed in new parts of the region.

Figure 10

Annual capex will remain steady over the period to 2025; 5G will account for a growing share as operators begin to prepare their networks for the 5G era

Billion



Spotlight on Ethiopia: market liberalisation bodes well for growth

In May 2021, the Ethiopian government awarded a telecoms licence to a consortium led by Kenya’s Safaricom. The winning bid, which also includes Vodafone Group and South Africa’s Vodacom, offered to pay \$850 million for the licence. This marks the end of one of the few remaining telecoms monopolies anywhere in the world and kickstarts a new phase in the telecoms market to be characterised by competition and choice for consumers.

The government also plans to sell a 40% stake in Ethio Telecom and reopen bidding for a second telecoms operator licence, which would include the right to operate mobile financial services. Both moves could bring more international operators and investors with significant expertise to the market.

Competition and choice often lead to lower prices and better quality of service for consumers. These have the potential to drive mobile adoption in Ethiopia – the region’s second most populous country but one that lags behind many of its regional peers on key telecoms indicators. Competition will attract much-needed investment and drive innovation in the market. Safaricom plans to spend \$8.5 billion over 10 years in network infrastructure and services, and will be keen to introduce many of its services, including M-Pesa, to Ethiopia.





02

Key trends shaping the mobile industry



| 2.1 5G: Sub-Saharan Africa takes a measured approach

5G continues to make progress globally; in the 12 months to June 2021, 90 new commercial 5G networks were launched, compared to 69 in the preceding 12 months, taking the total to 169. Commercial 5G services are now available in every region of the world, making it a truly global technology. By the end of 2021, 5G connections will account for 8% total mobile connections globally, while 5G networks will cover more than a fifth of the world's population.

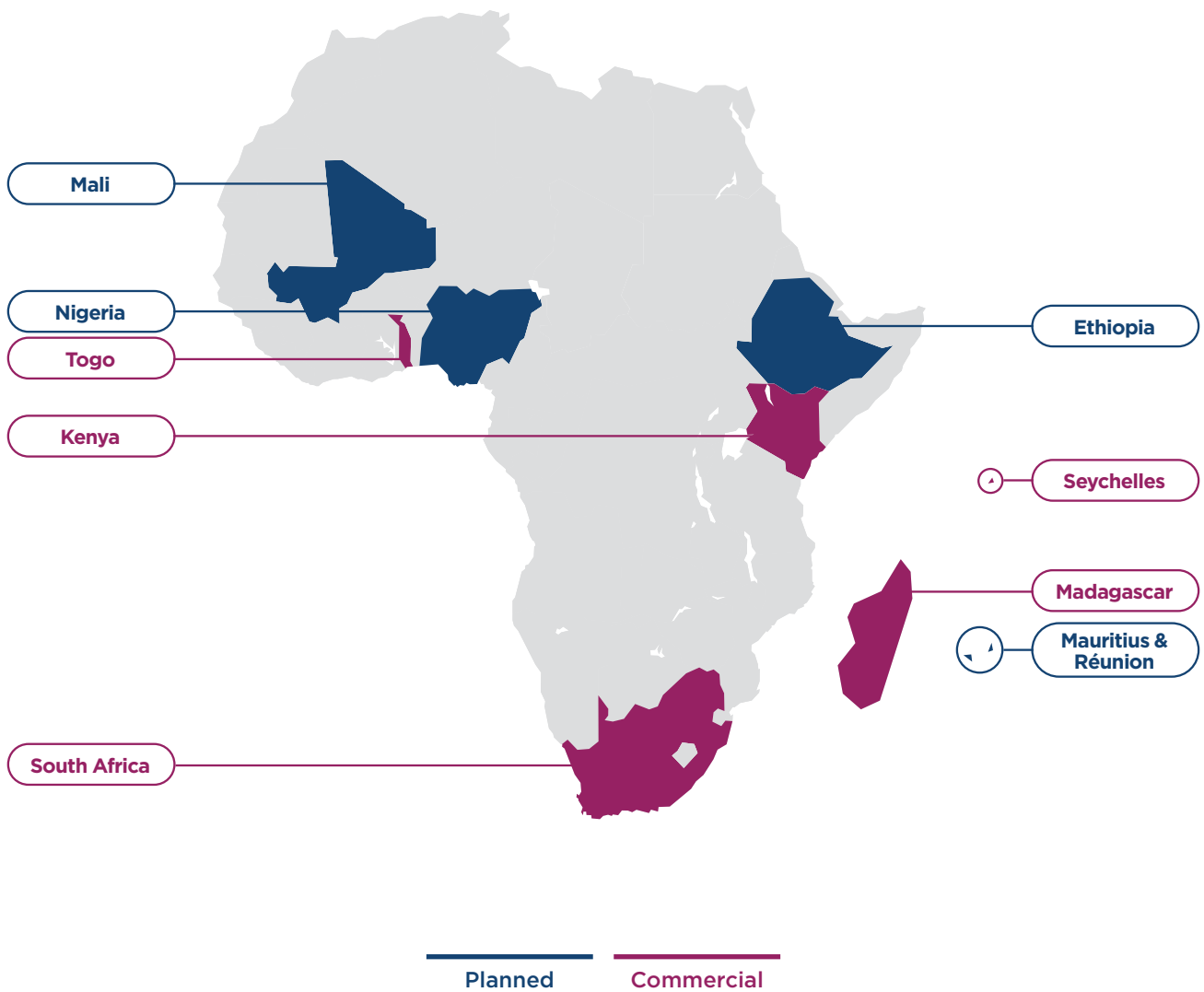
Network rollout is a first step to realising 5G's potential, with the availability of applications an important next stage. As a result, operators and other stakeholders in pioneer 5G markets are increasingly focussing on the development of

commercially viable 5G services for consumer and enterprise use cases. This includes investment in 5G labs dedicated to co-creating solutions with partners, including startups, academia, cloud providers and enterprises, to address specific needs.

In Sub-Saharan Africa, the journey to 5G has begun but it is still early stages for network deployment and commercialisation. By the end of June 2021, there were seven commercial 5G networks in five markets across the region. In these markets, 5G coverage remains limited to major cities. Enhanced mobile broadband (eMBB) and fixed wireless access (FWA) services are the main use cases.

Figure 11

5G footprint expands across Sub-Saharan Africa, but mass rollout is still some way off



Note: data as of end of June 2021

The cautious approach to 5G in Sub-Saharan Africa reflects the greater urgency to maximise the existing capacity of 4G networks. 4G is now available to more than half the region's population – but the technology accounts for just 15% of connections, on average, compared to 57% globally. Furthermore, 5G networks are capital intensive and come with operational complexities. As such, evidence of sufficient demand for enhanced connectivity services to justify investments in large-scale deployments is a vital indicator of 5G market readiness.

The increase in use of broadband for work, learning, entertainment and other activities due to lockdown measures to curb the spread of the pandemic is indicative of the potential demand for enhanced connectivity. Given low fixed broadband penetration, particularly in residential locations, most of the increases in data traffic in Sub-Saharan Africa were recorded over mobile networks. With digital technologies and online platforms set to become more integral to everyday life post pandemic, 5G networks will be crucial to meeting future demand for enhanced connectivity services by households and businesses.

To this end, operators and other stakeholders in Sub-Saharan Africa have begun to prepare for a 5G future, as evidenced by recent developments across the region such as the following:

- **South Africa** – MTN has taken steps to expand its 5G coverage with the deployment of 5G sites in Polokwane in Limpopo and Emalahleni (Witbank) in Mpumalanga. MTN also plans to expand its 5G network in the Eastern Cape province, with deployments in Gqeberha and East London.
- **Nigeria** – The Nigerian Communications Commission (NCC) and Nigerian Communications Satellite (NigComSat) have signed a Memorandum of Understanding (MoU) on the use of C-band spectrum (3.4–3.9 GHz) for 5G services. Most 5G launches globally have so far relied on 3.5 GHz spectrum, which provides a valuable middle ground between capacity and coverage for 5G networks.
- **Mauritius** – MyT Mobile has launched four MyT 5G Experience Zones as part of its transition to commercial 5G services. Customers will be able to register to connect to the 5G network in the cybercity regions of Ebene, Trianon, Bagatelle and Reduit.
- **Mali** – Orange has launched a 5G pilot in Bamako, with customers able to test the network with 5G-capable devices. Orange plans to launch 5G across several markets in the region by 2022.
- **Angola** – New licensee Africell is working with Nokia to deploy the latter's AirScale Single Radio Access Network (S-RAN) across up to 700 sites to concurrently support 2G, 3G and 4G services, and be 5G-ready. Nokia's AirScale platform can be seamlessly upgraded to support 5G networks through a software update.
- **Uganda** – MTN has started the process of automating its network, through a partnership with the Telecom Infra Project (TIP), in preparation for 5G. MTN plans to deploy TIP's Disaggregated Cell Site Gateway technology to build transport products and network capabilities at 2,500 sites across the country to support a smooth transition to 5G.
- **Zambia** – The Zambia Information and Communication Technology Authority (ZICTA) has opened a public consultation inviting stakeholders to provide feedback on its proposals for 5G spectrum bands. The consultation will inform ZICTA's spectrum planning and licensing decisions, including: selecting priority bands for 5G; choosing an allocation strategy; identifying bandwidth requirements for operators; creating a planning process to prepare the selected bands for use; setting out a fair and transparent licensing process to suit each available band; gauging market demand; and setting out a 5G roadmap.
- **Cameroon** – MTN Cameroon has disclosed that it has applied for permission to deploy and operate a trial 5G network. Approval from the telecoms regulator Agence de Regulation des Telecommunications (ART) would enable it to test 5G services in the country.



2.2 Telco of the future: open RAN gains ground

The mobile industry is experiencing a paradigm shift in network infrastructure models, with operators large and small increasingly considering open RAN solutions for network deployment and operation. Although open RAN is still in its infancy, with vendors competing to build out their solutions, operator commitments, trials and deployments indicate growing momentum behind the technology. As of July 2021, 38 countries around the world had active open RAN trials, deployments or commitments.

Open RAN has become the native approach to 5G networks for a number of high-profile operators, notably Rakuten in Japan and Dish in the US. Meanwhile, operators are taking a collaborative approach to the development of open RAN technology. In May 2021, Deutsche Telekom, Orange, Telefónica, TIM and Vodafone issued a white paper

outlining their technical requirements for the open, disaggregated RAN products they want to roll out in significant deployments from 2022. In July 2021, Etisalat Group, Mobily, STC, Zain Group and du signed an MoU to progress the implementation of open RAN solutions across their footprints.

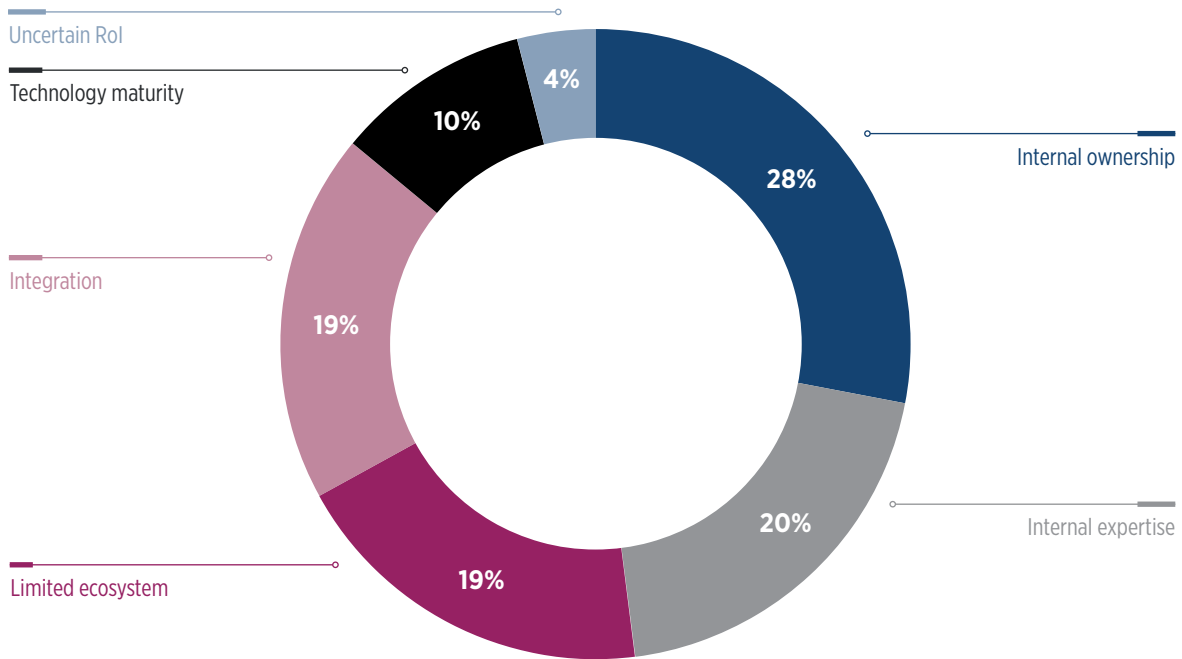
Every new technology faces challenges to its deployment and adoption; open RAN is no different. GSMA Intelligence research, based on a survey of 100 operators globally, revealed that the top challenges include uncertainty around internal ownership, the integration of solutions in a multi-vendor scenario and limitations in terms of supplier diversity. Vendors should seek to address these challenges to drive greater scale of open RAN deployments.

Figure 12

Source: GSMA Intelligence Network Transformation Survey 2021

Most operators view uncertainty around internal ownership as the top obstacle to open RAN deployment; only 4% highlight uncertain return on investment

What is the greatest obstacle to deploying open RAN in your network? (Percentage of operators)



The motivations behind implementing open RAN vary among operators. For operators in Sub-Saharan Africa, the promise of reducing the cost of deploying and operating networks, particularly in low-ARPU scenarios such as rural areas, is significant. Three in five people in the region live in rural areas, where the economics of network deployment by conventional methods are challenging. However, operators are also factoring in the opportunity to diversify network equipment supply chains, strengthen their bargaining power with suppliers, reduce vendor lock-in, and boost flexibility to innovate and more quickly deploy key network elements.

The adoption of open RAN technology in Sub-Saharan Africa is being led by some of the region's largest mobile operators, including MTN, Orange and Vodacom. Most of the activities so far have been trials, but commercial deployment has started in several markets and will increase in the coming years as operators increasingly seek efficiencies in network rollout and operations. For example, Vodacom South Africa has started the commercial trial of a disaggregated cell site gateway (DCSG) system in collaboration with the Telecom Infra Project (TIP), to assess the DCSG's performance in live 4G and 5G network environments.

MTN ramps up open RAN ambitions

MTN has been exploring open RAN technology since 2019, when it first began rolling out the technology in a limited way to help tackle rural coverage issues. In 2020, MTN signed a deal with Parallel Wireless, Vanu and NuRAN to deploy around 5,000 open RAN sites across Africa. MTN also announced a partnership with TIP to evolve its transport infrastructure to support traffic growth in the coming years. MTN has revealed that it has more than 1,100 commercial open RAN sites in over 11 countries.

Open RAN is set to play an important role in MTN's network modernisation plans. In June 2021, the company announced it was working with Voyage, Tech Mahindra, AltioStar, Mavenir and Parallel Wireless to expand 4G and 5G services in Africa more quickly and cheaply, and help it achieve its environmental goals of net-zero emissions by 2040.

MTN's open RAN strategy draws attention to the potential of the technology in the region. The operator's extensive footprint and engagement with some of the biggest open RAN vendors could help drive scale and commercialisation over the coming years.

2.3 Digital platforms: pandemic spurs changes in consumer behaviour

Digital platforms play an increasingly important role in developing economies, eliminating inefficiencies in traditional business models and extending the reach of services to more users. In Sub-Saharan Africa, many start-ups created during the last decade have grown exponentially, and are now helping to deliver better quality education, improved health outcomes and other positive societal contributions for millions of people. Unlike traditional businesses, digital platforms have the potential to generate network effects, whereby an additional user on a digital platform increases the value of the platform for other users.

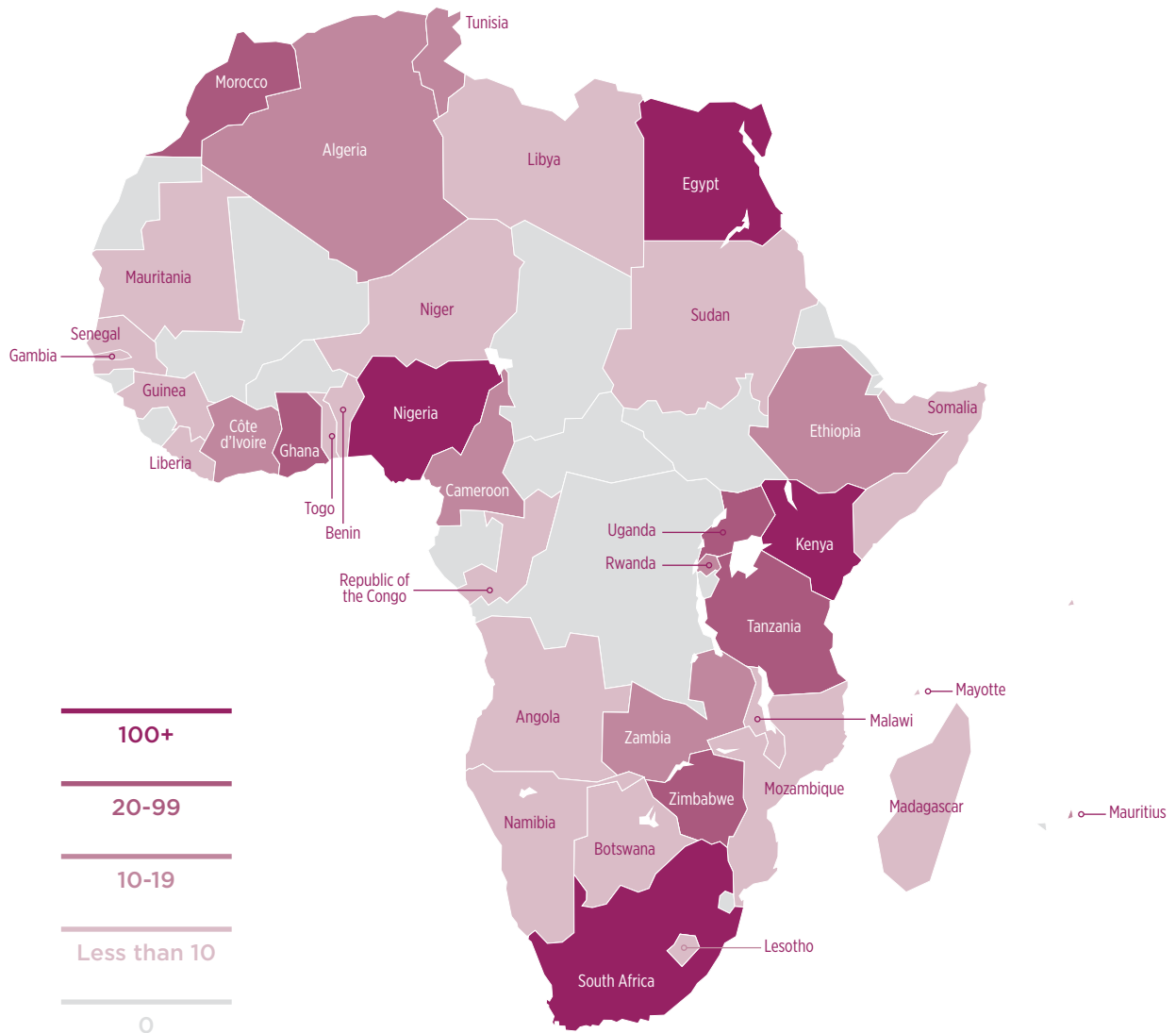
The importance of digital platforms has been underlined by the Covid-19 pandemic. As lockdowns became the new normal, consumers increasingly relied on digital platforms to work, learn, shop and access life-enhancing services. For example, e-commerce platform Jumia reported a 50% increase in transactions during the first six months of 2020, indicating a notable shift to online shopping during lockdown. The marked change in consumer behaviour to a more digital-centric lifestyle will be a key feature of the post-pandemic world, with entrepreneurs using digital platforms to broaden customer reach and build more resilient business models.

Source: GSMA Intelligence, based on Tracxn data (first published in [Scaling digital platforms through partnerships](#))

Figure 13

There are over 1,200 digital platforms in Africa; five countries – Nigeria, South Africa, Kenya, Egypt and Ghana – account for 80% of these

Number of active digital platforms in Sub-Saharan Africa (correct as of January 2021)



Note: includes North Africa

Digital platforms in the financial services and healthcare sectors recorded strong investor confidence and consumer interest during the pandemic. This was mainly due to social distancing measures and initiatives to support public health efforts to combat the pandemic using digital technologies. In 2020, 50+ fintech companies in the region raised around \$821 million in funding – a third more than the previous year. Although the amount raised by health-tech companies during the same period is considerably less at \$110.6 million, it still represents a more than threefold increase on the previous year.

The coming years will see digital platforms move to scale their operations in a bid to capture new opportunities within their domestic markets and across the region. In many cases, this will be achieved through consolidation to create synergies and through geographical expansion into new markets. For example:

- In August 2021, fintech company OPay raised \$400 million in new financing led by SoftBank

Vision Fund 2, valuing the company at \$2 billion. Opay was founded in Nigeria in 2018, enabling unbanked and underbanked users to send and receive money and pay bills through a network of agents. In 2020, the company expanded to Egypt as an entry point to the Middle East market.

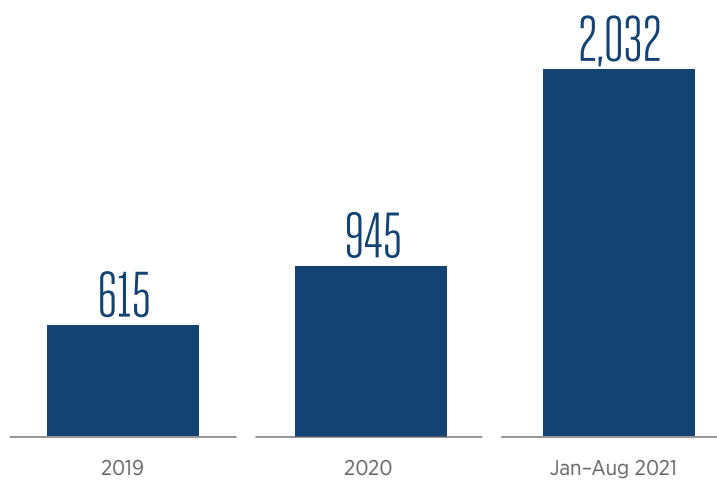
- South African payments and software platform Yoco raised \$83 million in July 2021 to develop new solutions for small businesses.
- Nigerian health-tech startup Field Intelligence plans to expand to 11 more cities across Nigeria and Kenya. Field Intelligence currently has a network of 700+ pharmacies across the region. It intends to reach 2,000 pharmacies by 2022 and 12,000 by 2025.
- In March 2021, Nigerian payment processing firm Flutterwave raised \$170 million in new funding to reach a valuation of \$1 billion. Flutterwave is now present in 12 countries across Sub-Saharan Africa and intends to extend its network to North Africa.

Figure 14

Source: Africa: The Big Deal

During the first eight months of 2021, startups in Africa raised more than the combined amount for 2019 and 2020

Funding raised by startups in Africa through \$1 million+ deals (\$ million)



Note: includes North Africa

Mobile operators play a central role in Sub-Saharan Africa's digital platforms landscape, primarily as providers of connectivity to access and distribute digital services, but increasingly as providers of digital platforms through direct ownership, investment and/or in partnership with third-party tech innovators. Examples include the following:

- **Orange Digital Ventures** has invested in PayJoy – a digital platform that helps individuals with limited access to conventional loans buy a

smartphone on credit. The company operates in more than 10 countries.

- **MTN Benin** zero-rates the Gozem app, allowing drivers and riders to use the platform without using their mobile data allowance.
- **Safaricom** is developing a mobile-based digital health platform that allows users to access a copy of their own health information and share it with trusted health providers.

Vodacom centres growth strategy on digital platforms

Vodacom has made digital services a part of its Vision 2025 strategy to better serve its customers and create value. The operator uses a platform approach to deliver digital services, spanning several verticals, to consumers. Examples include the following:

Health – Vodacom launched its Mum & Baby platform in the Democratic Republic of the Congo in 2021, with a view to reach 200,000 users by 2025. Meanwhile, in Tanzania, the Healthy Pregnancy Healthy Baby platform (locally known as Wazazi Nipendeni) provides maternal health information to 1.3 million registered users.

Financial services – Vodacom launched VodaPay Super App, in partnership with global digital lifestyle services platform Alipay, in June 2021. More than 70 businesses have signed up or committed to the platform, positioned as a 'one-stop shop' for online transactions.

Education – Vodacom's e-School has 1.25 million registered learners with access to digital educational content. During the Covid-19 lockdown, usage increased fourfold from around 37,500 to a peak of nearly 150,000 student events each day.

Employment – Vodacom's ConnectU job portal has enabled 3.1 million people to access job search websites for free, including users in low-income groups. During lockdown, Vodacom expanded the platform to enable customers to pay for electricity and water.

Digital platforms provide a number of benefits for operators, including generating new revenue streams from adjacent services, encouraging subscribers to use more data, and creating opportunities for market differentiation and added value for customers. Partnerships provide a faster and cheaper route

into digital platforms for operators, compared to developing their own solutions. Nonetheless, operators should not rule out building their own digital platforms, particularly if there is a lack of potential partners in their local market.



03

**Mobile
contributing to
economic growth
and addressing
social challenges**

3.1 Mobile’s contribution to economic growth

In 2020, mobile technologies and services generated 8% of GDP in Sub-Saharan Africa – a contribution that amounted to more than \$130 billion of economic value added. The mobile ecosystem also supported more than 3 million jobs (directly and indirectly) and made a substantial contribution to the funding of the public sector, with almost \$15 billion raised through taxes.

By 2025, mobile’s contribution will grow by more than \$20 billion (passing \$150 billion), as countries in the region increasingly benefit from the improvements in productivity and efficiency brought about by the increased take-up of mobile services.

Figure 15

Source: GSMA Intelligence

The Sub-Saharan Africa mobile ecosystem directly generated almost \$40 billion of economic value in 2020, with mobile operators accounting for the majority

Billion, percentage of GDP (2020)

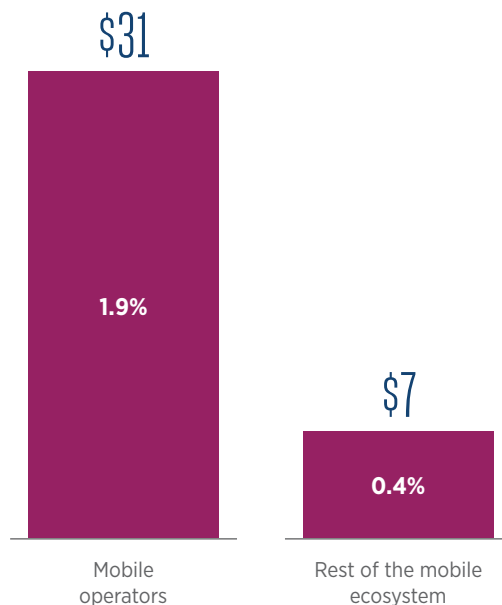
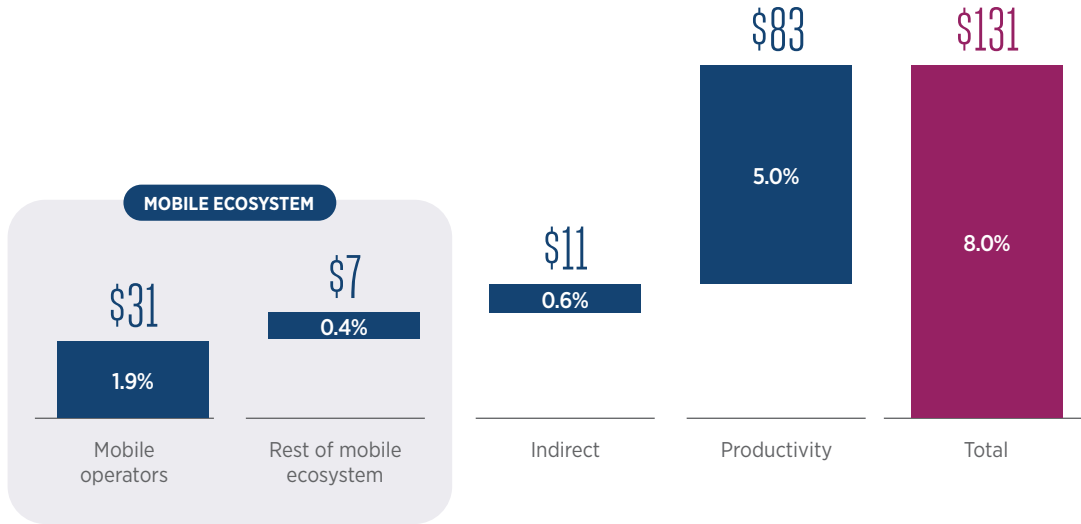


Figure 16

Additional indirect and productivity benefits bring the total contribution of the mobile industry to the regional economy to more than \$130 billion

Billion, percentage of GDP (2020)

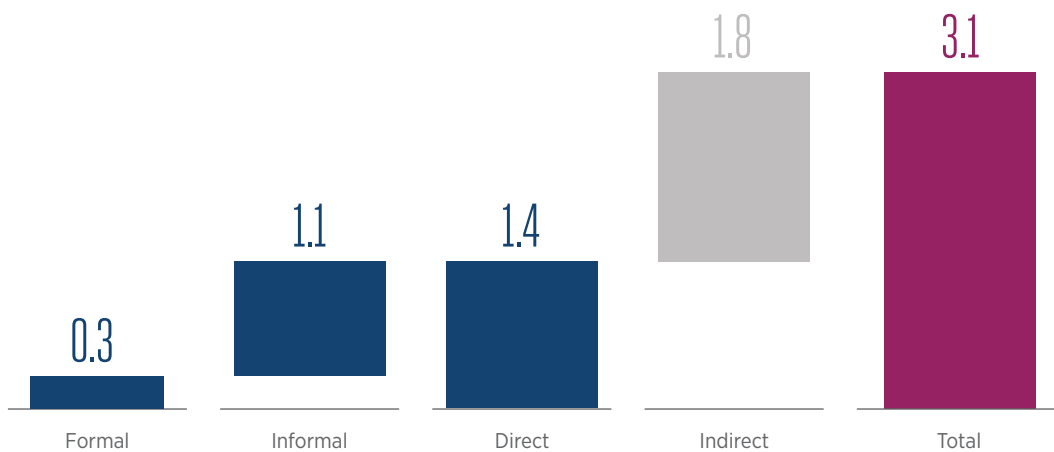


Note: totals may not add up due to rounding

Figure 17

The mobile ecosystem formally employs almost 300,000 people in Sub-Saharan Africa, 1.1 million informally, and supports another 1.8 million jobs in other parts of the economy

Jobs (million), 2020



Note: totals may not add up due to rounding

Figure 18

Source: GSMA Intelligence

In 2020, the mobile ecosystem contributed almost \$15 billion to the funding of the public sector in Sub-Saharan Africa through consumer and operator taxes

Billion

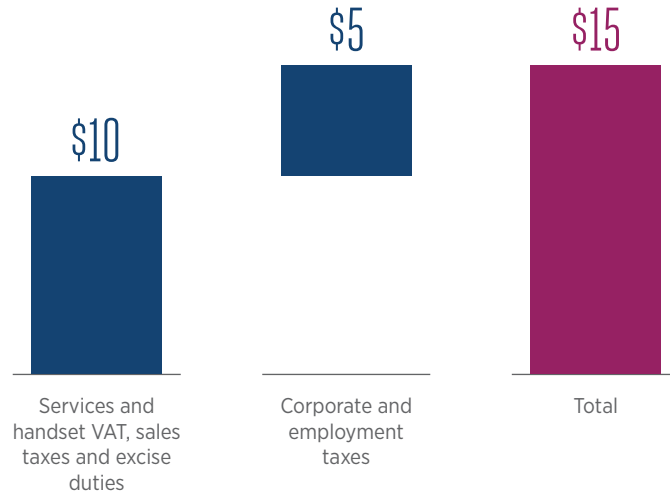
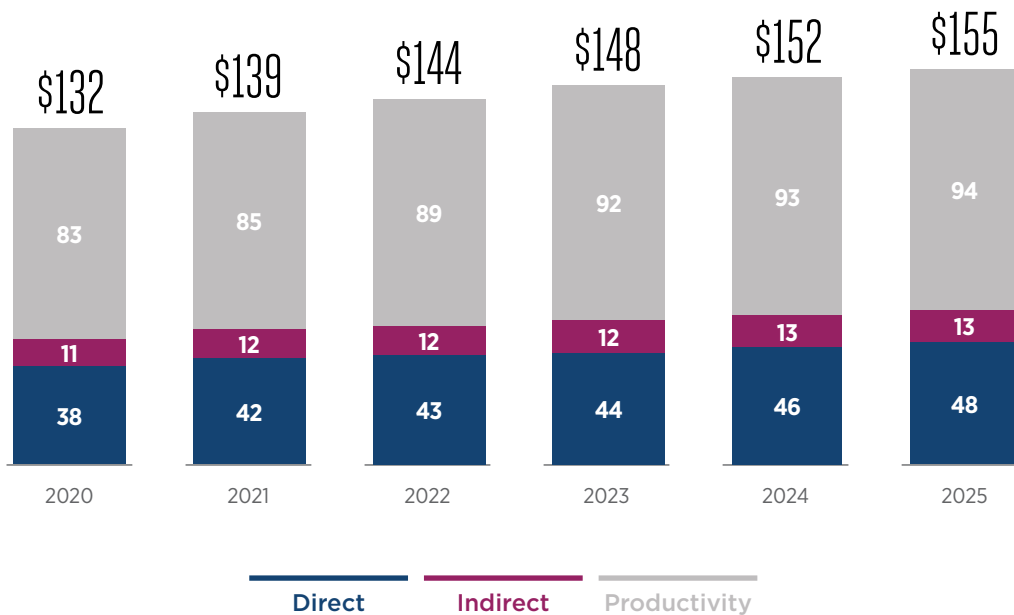


Figure 19

Source: GSMA Intelligence

Driven mostly by continued expansion of the mobile ecosystem, the economic contribution of mobile in Sub-Saharan Africa will increase by around \$20 billion by 2025

Billion



3.2 The mobile industry's response to Covid-19

The Covid-19 pandemic has taken a significant toll on the economic and social well-being of people in Sub-Saharan Africa. In addition to the initial outbreak of the pandemic in early 2020, countries in the region have experienced second and third waves of infections and mortalities. Throughout this period, mobile technology has served as a lifeline for society by enabling business activities to continue, supporting social interactions during lockdown and helping governments manage the pandemic.

Efforts by mobile operators at the early stages of the pandemic to keep people and enterprises connected, and to provide targeted support for vulnerable individuals and communities, are well documented. More recently, mobile operators have adopted measures to help society recover, such as supporting vaccine rollout initiatives and enabling people and small businesses to leverage digital technologies in challenging times. Examples include the following:

- **Vodacom** has partnered with the African Union Development Agency (AUDA-NEPAD) to offer the

mVacciNation digital toolbox – a platform that manages vaccination appointments and stock availability – in up to 55 African Union member states. In South Africa, the National Department of Health has used mVacciNation to register health workers on its Covid-19 Electronic Vaccine Data System.

- **MTN** has donated \$25 million to support the African Union's Covid-19 vaccination programme. The donation will help secure up to 7 million doses of the vaccine for health workers across the continent, which will contribute to the vaccination initiative of the Africa Centres for Disease Control and Prevention.
- **The Orange Foundation** has committed additional funding to support the fight against Covid-19 across its footprint, including its 13 markets in Sub-Saharan Africa. As well as providing protection kits and medical equipment, Orange is facilitating access to the Covid-19 vaccine for African countries.

3.3 Mobile enabling a more inclusive society

Enhancing digital inclusion

At the end of 2020, just over 300 million people across Sub-Saharan Africa were connected to the mobile internet, equivalent to 28% of the population. Around 33 million people connected to the mobile internet for the first time in 2020 – the biggest annual increase to date in the number of new internet users. Much of the growth in 2020 was driven by the shift to online platforms for work, education, social interaction and other activities during Covid-19 lockdowns, with operators recording sharp increases in data subscriptions and usage.

However, more than 700 million people in Sub-Saharan Africa remain offline and at risk of exclusion from the emerging digital economy. Although the

coverage gap remains significant at nearly a fifth of the population, the usage gap suggests there are pressing issues to address, beyond infrastructure, to increase take-up.

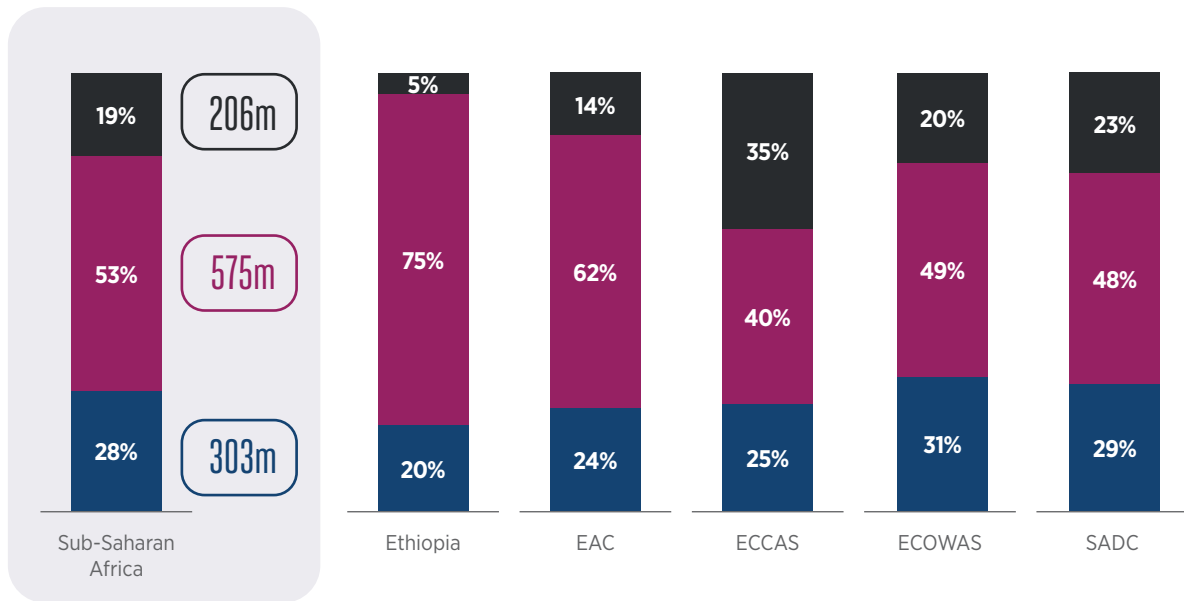
With continued efforts to improve the enablers of mobile internet adoption (including affordability, consumer readiness and availability of content/services), the usage gap will continue to narrow. By 2025, more than 170 million people across the region will start using mobile internet for the first time. By this point, around 474 million people in Sub-Saharan Africa (39% of the population) will be mobile internet users.

Figure 20

Source: GSMA Intelligence

More than two thirds of the population in Sub-Saharan Africa remain unconnected

Percentage of population (2020)



Coverage gap
(People without access to mobile internet services)

Usage gap
(People who live in areas covered by mobile broadband networks but do not yet use mobile internet services)

Connected
(Mobile internet subscribers)

Smartphone affordability in Sub-Saharan Africa

Smartphone adoption in Sub-Saharan Africa more than doubled between 2015 and 2020, but smartphones still only account for around half of total connections. Smartphone affordability,

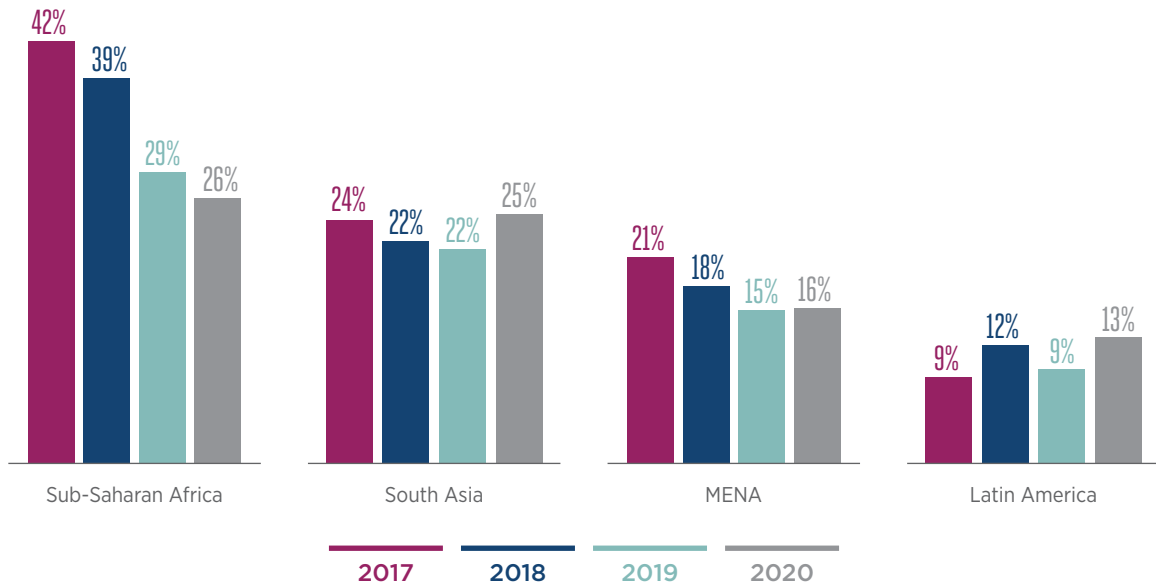
particularly of 4G devices that enable a better user experience, is a major factor behind the relatively low smartphone adoption rate and, by extension, the mobile internet usage gap in Sub-Saharan Africa.

Source: GSMA Intelligence calculations based on pricing data from Tarifica

Figure 21

Smartphone affordability is improving, but there is some way to go

Cost of device as a percentage of monthly GDP per capita



Covid-19 has had a mixed impact on smartphone adoption in Sub-Saharan Africa. While it has increased demand for connectivity and devices, it has also resulted in supply chain disruptions due to lockdown measures. Covid-19 could also exacerbate the affordability challenge, given that extreme poverty in the region rose by 8% in 2020 and could rise by another 2% in 2021.

Lightweight operating systems and financial solutions have emerged in recent years as ways to improve smartphone affordability, though with trade-offs for users. The two approaches have the potential to appeal to different segments of the market.

LIGHTWEIGHT OS DEVICES

- Devices running on lightweight operating systems, such as KaiOS, with a low upfront cost for consumers. Some devices are priced at less than \$30.
- Backed by the biggest operators in the region, including MTN, Orange and Vodacom.
- Although devices come with popular apps, such as WhatsApp, Facebook and YouTube, consumers miss out on a wider range of options available on Android and iOS.
- Small screen size and low resolution (reflecting efforts to keep costs down) diminish the overall user experience.
- Suitable for long-term 2G users, who require a gradual introduction to the online world and may view the lower device specification as a reasonable trade-off for a much lower cost of ownership.

FINANCING SOLUTIONS

- Smartphones with full specification and advanced features, often priced above \$100.
- Instalment payment options help to offset the impact of prohibitive upfront costs for many consumers.
- Mobile operators (e.g. Airtel, MTN, Safaricom and Vodacom), device OEMs (e.g. Mara Phones) and pay-as-you-go utilities providers (e.g. M-KOPA) have used this model.
- Challenges around master subsidy lock mechanisms, and lack of credit scoring and insurance facilities to mitigate risks for financiers.
- Suitable for more aspirational consumers looking for advanced features, such as large touchscreens and full access to established app stores, but who are unable to pay high upfront costs for devices.

Several initiatives introduced by mobile operators and other ecosystem players over the last two years to improve smartphone affordability are already having a positive impact on adoption levels:

- Around 250,000 customers bought 4G smartphones through Safaricom's financing project, Lipa Mdogo Mdogo, between launch in July 2020 and the end of March 2021.
- Vodacom sold more than 500,000 low-cost smart feature phone devices in Tanzania at a cost of \$25 between 2019 and March 2021. The operator also sold 750,000 low-cost devices priced at \$20 in Mozambique.
- M-KOPA launched smartphone financing in 2019 and has sold more than 500,000 smartphones through its platform to customers in Kenya, Uganda and Nigeria.



Enhancing financial inclusion

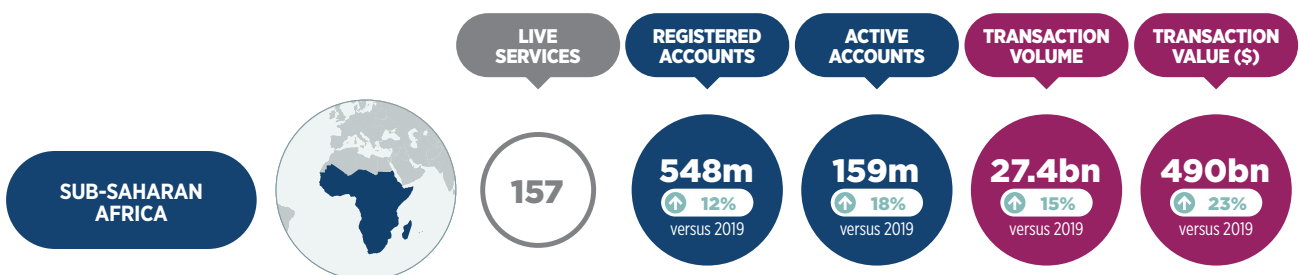
Mobile money continues to play a central role in efforts to enhance financial inclusion in Sub-Saharan Africa. By the end of 2020, the region accounted for 64% of all mobile money value transacted globally, reaching \$490 billion for the year – an increase of

23% on the previous year.¹ The number of registered accounts also exceeded half a billion, a third of which were active on a monthly basis. Although absolute growth was highest in West and East Africa, Southern Africa grew the fastest at 24% year on year.

Source: GSMA Mobile Money programme

Figure 22

Mobile money indicators registered strong growth in 2020, helped by efforts to drive adoption and usage in the wake of the pandemic



1. State of the Industry Report on Mobile Money, GSMA, 2021

During the pandemic, demand for mobile money increased among businesses, governments and new services that previously relied on cash or other payment channels. Many national regulators declared mobile money an ‘essential service’, in line with efforts to reduce reliance of cash, based on concerns that it could serve as a vector of transmission for the virus. As a result, regulators and mobile operators introduced measures to increase the adoption and use of mobile money, including the easing of know-your-customer (KYC) requirements, simpler on-boarding processes, discounts on transaction fees and higher transfer limits.

Mobile money will shape Sub-Saharan Africa’s post-pandemic economic landscape, mainly by enabling new and more resilient operating models for businesses, and facilitating cheaper, safer and more transparent transaction processes across the economy. Latest company reports show that the combined transactions value for the four leading mobile money platforms in the region – M-Pesa, MTN MoMo, Airtel Money and Orange Money – has reached \$50 billion per month.

Mobile money will also remain the primary tool for extending financial services to the region’s large and dispersed population, building on the extensive reach of mobile networks and utility of mobile money platforms, beyond basic transfers. Much of the success of mobile money depends on operators’

continued investments in their mobile money platforms and distribution networks to reach new customers and improve the user experience. For example:

- **MTN Group** announced a partnership with Flutterwave in September 2021 that will allow businesses integrating the Flutterwave platform in Cameroon, Côte d’Ivoire, Rwanda, Uganda and Zambia to receive payments through MTN MoMo.
- **Safaricom** has launched the M-Pesa app to enhance customer experience. M-Pesa has helped increase financial inclusion in Kenya to more than 82% of the adult population, from around 25% before the launch of the service.
- **Orange** is stepping up plans to expand Orange Bank Africa to other markets in the region as well as expand the range of services on offer beyond savings and credit. The service was launched in Côte d’Ivoire in July 2020 and now has more than 500,000 customers.
- **Airtel Africa** raised a total of \$500 million between March and August 2021 from the Rise Fund, Mastercard and Qatar Holdings for its mobile money service Airtel Money, at a valuation of \$2.65 billion. The investments will fund the expansion of Airtel Money services across the operator’s regional footprint.



Closing the gender gap

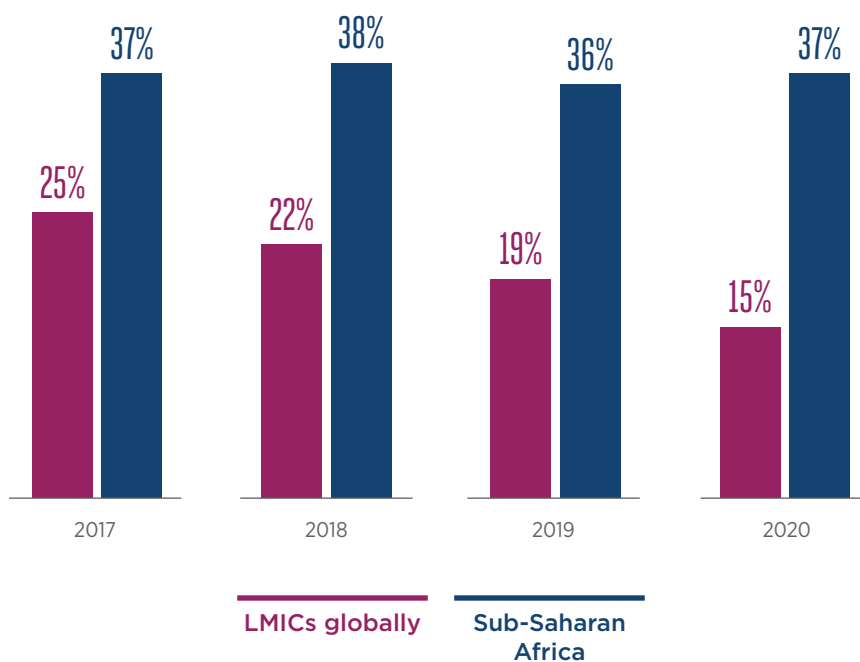
Growth in mobile internet access has been remarkable in Sub-Saharan Africa. However, although it is the primary way most people in the region access the internet, the gender gap in mobile internet access and use remains significant. Across the region, women are still 13% less likely than men to own a mobile phone, compared to 7%

globally. The gender gap in mobile internet use is even starker, at 37% – the highest of any region. This compares to a global average of 15%.² The gap deprives women of access to crucial information and services online, as well as opportunities to meet their life needs in an increasingly digital society.

Source: GSMA

Figure 23

The gender gap in mobile internet use³ in Sub-Saharan Africa remains unchanged since 2017, despite notable improvements across low- and middle-income countries



The pandemic appears to have exacerbated the gender gap in some countries, with mobile internet adoption and use rising faster among men than women. In Kenya, for example, mobile internet use among women has remained flat while use among men has increased, creating an even wider

gender gap.⁴ In this context, much work remains to be done to distribute the benefits of connectivity equally. These benefits are even more critical as the Covid-19 pandemic evolves and impacts health, livelihoods and economies around the region, disproportionately affecting women.

2. [The Mobile Gender Gap Report 2021](#), GSMA, 2021

3. Mobile internet use is defined as having used the internet on a mobile phone at least once in the last three months. Mobile internet users do not have to personally own a mobile phone. The gender gap in mobile internet use refers to how much less likely a woman is to use mobile internet than a man. Regional averages were calculated from country-level data. Based on survey results and modelled data for adults aged 18+.

4. GSMA Consumer Survey 2020

Lessons from Safaricom's Maisha Ni Digital campaign⁵

In Kenya, mobile users who are aware of mobile internet but do not use it face three main barriers: affordability of handsets, knowledge and digital skills, and relevance of mobile internet to their lives. To address these barriers, Safaricom launched the Maisha Ni Digital (Life Is Digital) campaign in partnership with Google in 2018. This takes a holistic approach to increasing mobile internet use among priority groups, including women, by offering a 4G smartphone at an attractive price.

In 2019, the 4G-enabled Neon Ray smartphone, sold for KSH3,999 (\$35), was the flagship device for the campaign. More than 500,000 Neon Ray smartphones have been purchased, with 54% by women. A GSMA study found that after a smartphone was acquired through the Maisha Ni Digital campaign, internet use tended to increase substantially and delivered value to Safaricom's customers by empowering them and improving their personal and professional lives.

The Maisha Ni Digital campaign has helped Safaricom and Google increase the number of women using mobile internet in Kenya. To implement initiatives that can help close the gender gap in other markets, mobile operators and other stakeholders should look to the following:

- Provide customers in underserved groups, especially women, with more affordable internet-enabled handsets.
- Address barriers beyond affordability in parallel, such as digital skills and relevance.
- Improve understanding of how data packages work to help address the data affordability barrier.
- Make digital skills training material more accessible by using local languages, audio and video, and images. This is particularly relevant when targeting women in LMICs, given lower literacy levels relative to men.

3.4 The industry's commitment to sustainable development

As the first industry to have committed fully to the United Nations (UN) Sustainable Development Goals (SDGs), the mobile industry continues to have substantial positive effects on lives and livelihoods.⁶ Mobile operators and technologies contribute positively across the SDGs by providing critical and resilient telecoms infrastructure and promoting

inclusive societies. They also enable equitable access to online educational content and tools, which has become vital during the Covid-19 pandemic, allowing many students to learn remotely. Mobile connectivity also enables innovative solutions that drive productivity gains in a range of other industries, such as agriculture and financial services.

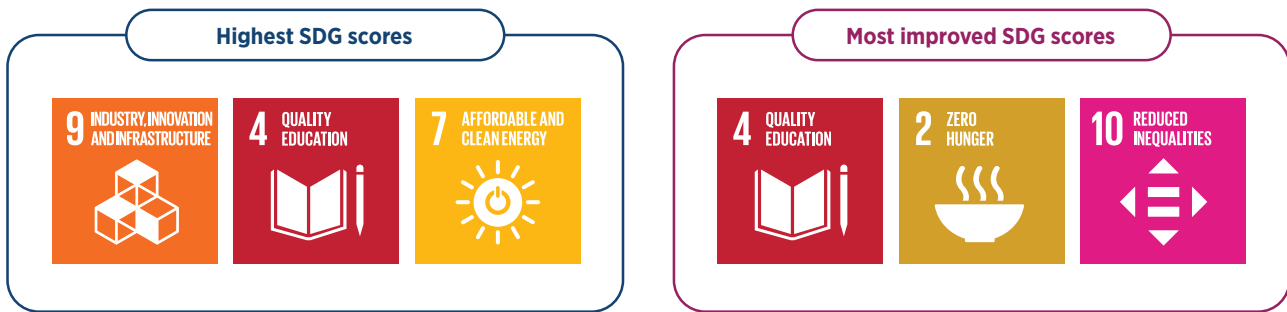
5. [Safaricom's Maisha Ni Digital Campaign: A holistic approach to address the barriers preventing Kenyan women from using mobile internet](#), GSMA, 2021

6. 2020 Mobile Industry Impact Report: Sustainable Development Goals, GSMA, 2020

Figure 24

Mobile operators' investments in network infrastructure underpin the significant impact on SDG 9, but significant progress is being made in other areas too

Mobile's impact on the SDGs in Sub-Saharan Africa, 2020



The mobile industry continues to show leadership in the global race to net zero. Mobile operators and the GSMA are taking collaborative action to be fully transparent about the industry's carbon emissions and have developed an industry-wide climate action roadmap to achieve net-zero greenhouse gas (GHG) emissions by 2050, in line with the Paris Agreement. Globally, more than 50 mobile operators now disclose their climate impacts and GHG emissions via the internationally recognised CDP global disclosure system.⁷ The mobile sector has also been credited by the UN for achieving a critical breakthrough towards its mission of combatting climate change.

In Sub-Saharan Africa, the use of diesel generators to power mobile towers in off-grid locations and for back-up power in urban areas where public power supply can be irregular is a notable source of GHG emissions. Nearly half of all towers in Sub-Saharan Africa are still categorised as either off-grid or bad-grid, and more than 80% of these continue to run on diesel power.⁸ Furthermore, the 7 million

metric tonnes of CO₂e emitted from mobile towers' diesel generators was estimated to account for approximately 3% of the industry's total emissions in 2020.⁹

Renewable energy will be essential to the mobile industry meeting its climate targets. Nearly 70,000 towers worldwide are powered by renewable energy – a 45% increase since 2014. Despite having only about 3% of the world's towers, Sub-Saharan Africa now accounts for 14% of global green sites. This reflects the investment by operators and tower companies in innovative green energy solutions to reduce CO₂e and the operating cost of mobile towers. For example, Africa Mobile Networks (AMN), which provides a network-as-a-service solution to operators, is building small cell networks at scale in Africa. These sites are optimised for – and powered exclusively by – solar photovoltaic battery systems, with no diesel generator backup.

7. For more information, see: <https://www.cdp.net/en>





8. [Renewable Energy for Mobile Towers: Opportunities for low- and middle-income countries](#), GSMA, 2020

9. [2021 Mobile Industry Impact Report: Sustainable Development Goals](#), GSMA, 2021

Figure 25

Source: operators

Example commitments and actions by operators in Sub-Saharan Africa to reduce environmental impact of operations and reach net-zero carbon emissions

	<ul style="list-style-type: none"> • Orange has unveiled a sustainability strategy that includes a target to be using 100% renewable energy in its operations in West Africa by 2040. Orange intends to increase the use of renewable energy in its operations to 50% by 2025 from the current 24%, through its subsidiaries in Côte d'Ivoire, Liberia and Burkina Faso. • In the Democratic Republic of the Congo, Orange has partnered with NuRAN Wireless to build 2,000 solar-powered mobile towers, which will cover at least 10 million people in rural areas.
	<ul style="list-style-type: none"> • MTN has set science-based targets to achieve a 47% average reduction in absolute emissions (tCO₂e) for scope 1, 2 and 3 by 2030. GHG emission-reduction target-setting is in line with an ICT sectoral target-setting approach developed through collaboration between the Global Enabling Sustainability Initiative (GeSI), GSMA, the International Telecommunication Union (ITU) and the Science Based Targets Initiative (SBTi). • To realise its targets, MTN has launched its Project Zero programme to leverage the latest technologies and service partners to enable business sustainability through greater energy efficiencies, low carbon emissions, risk reduction and cost control. The programme prioritises renewable solutions, efficient emerging technologies and energy storage.
	<ul style="list-style-type: none"> • Safaricom has partnered with the Carbon Trust to take a strategic approach to managing its environmental impacts, with the aim of reaching net zero by 2050. • Safaricom has committed to a series of emission-reduction targets, including a 43% reduction by 2030 and a 74% reduction by 2050 from a 2017 base year. The targets have been approved by the SBTi.
	<ul style="list-style-type: none"> • Vodacom has set a target to reduce its environmental impact by 50% by 2025, against a 2017 baseline. Vodacom's plans to reduce carbon emissions focus on four key areas: energy efficiency (including IoT solutions), renewable energy, independent power producers and renewable energy certificates.



04

Policies for inclusive digital development

The pandemic has highlighted the increasing importance of digital technology to responding effectively to crises and planning for recovery. At the same time, the crisis has the potential to accelerate the continent's digital transformation, creating resilient digital jobs. The continued rollout of 4G and the initial stages of the 5G era open up opportunities in areas such as healthcare, digital commerce, industrial automation and smart city infrastructure.

Key to reaching the connectivity levels that can help power Sub-Saharan Africa's digital economy are effective partnerships between governments and mobile operators, as the primary providers of connectivity in the region. Such partnerships have the potential to drive investment and innovation in the wider mobile ecosystem to create life-enhancing

digital services for individuals and communities. There is also the need to address issues affecting efforts to expand coverage and deploy next-generation networks, and the ability of consumers to access and use digital services. Two particular issues that require attention in the region are spectrum management and fiscal policies.

4.1 Spectrum management

Spectrum roadmaps

A spectrum roadmap is essential to ensure there is enough spectrum to meet surging demand for mobile services in both the short and long term. Roadmaps help governments forecast future trends

and manage their work. For mobile operators, roadmaps mean increased certainty to invest based on the government's future allocation, renewal plans and management of radio spectrum.

Key themes for a spectrum roadmap

- Identify emerging opportunities and challenges to radio spectrum framework at least three to five years in advance.
- Identify future technological trends and drivers, and assess their impact on spectrum policy and planning.
- Plan spectrum management programmes to address challenges and maximise opportunities.
- Create a plan to review and update the roadmap regularly (an annual review is recommended).

Spectrum pricing

High spectrum prices continue to hinder the rollout of mobile services in both cities and rural areas. However, for countries willing to take a different approach, larger amounts of spectrum and lower spectrum prices are strongly linked to greater population coverage.¹⁰ The same is true for better

download speeds and increased service adoption. The main goal of governments around the world should be to get the most out of mobile spectrum resources. The GSMA has developed 10 positions¹¹ on the importance of fair spectrum pricing to support the effective management of spectrum resources.

10. [Effective Spectrum Pricing in Africa](#), GSMA, 2020

11. [Spectrum pricing – success in 10 steps](#), GSMA, 2021

Access to mid-band spectrum

Mid-band spectrum, in particular 3.5 GHz, is important for the future of 5G as it offers a good mix of coverage and capacity. In the short term, operators should have access to 80–100 MHz of contiguous spectrum in this band. Meeting long-term demand requires forward planning from policymakers. GSMA analysis shows that a total of 2 GHz of mid-band spectrum, on average, will be required to support the growth of 5G during the 2025–2030 timeframe.¹²

The 6 GHz band offers significant potential. It is already used for backhaul, and mobile operators are making a case for its use in 5G networks. Part of the band is also up for debate at WRC-23. Discussions regarding the band's future need to focus on maximising its value and balancing different uses.¹³

Digital switchover

Lack of access to sub-1 GHz spectrum due to slow digital switchover (DSO) is negatively affecting coverage expansion. Without this range, it can be very expensive – and thus impractical – to provide widespread rural mobile broadband services.

TV white space

The advantages of licensed mobile services over the unlicensed approach of TV white space (TVWS) include a more mature and developed ecosystem, better reliability, greater quality of service and increased coverage (due to higher power limits

Technology neutrality

Technology neutrality is an important capability that must be made available in any current or future band. This gives operators the flexibility to upgrade technologies as soon as the market requires.

To ensure access to sufficient spectrum, governments and regulators should look to the following:

- Plan to make 2 GHz of mid-band spectrum available in the 2025–2030 timeframe. This is the average amount needed to guarantee the IMT-2020 requirements for 5G.
- Carefully consider 5G spectrum demand when 5G usage reaches its peak and advanced use cases bring additional needs.
- Base spectrum decisions on practical factors, including population density and the extent of fibre rollout.
- Support harmonised mid-band 5G spectrum (for example, within the 3.5 GHz, 4.8 GHz and 6 GHz ranges) and facilitate technology upgrades in existing bands.

Experiences from around the world show that DSO-related challenges can be resolved and that consumers benefit from the improved coverage enabled by this range.

for licensed devices). Making TVWS available also creates a challenge for band clean-up when the rest of the UHF band is used for mobile services.

Refarming 2G, 3G and 4G bands can, in time, sustain the growth of 4G and contribute to meeting some of the future spectrum requirements for 5G which will ultimately require new bands.

12. [Vision 2030 - Insights for Mid-band Spectrum Needs](#), GSMA, 2021

13. [The importance of 6 GHz for 5G's future](#), GSMA, 2021

4.2 Forward-looking fiscal policies

In Sub-Saharan Africa, mobile consumers and operators are subject to a high tax burden, driven by sector-specific taxes – mainly excise duties paid by consumers and regulatory fees applied to mobile operators. Sector-specific taxes and fees account for a substantial part (38%) of total tax payments by operators and represent approximately 10% of mobile sector revenue. This is higher than mobile sector-specific taxes globally, which represent approximately 30% of tax payments by operators globally and around 7% of global mobile sector revenue.¹⁴

Reductions in sector-specific taxes can boost demand for mobile services, which can add value to the economy through the knock-on impact on other industries and growth in productivity. For example, in the Democratic Republic of the Congo, reducing excise duty on mobile services from 10% to 3% would

drive an increase in GDP of \$276 million (0.8%) and would raise annual tax receipts by \$21 million (0.2%) over the medium term.¹⁵

A growing number of countries are already showing what can be done to facilitate access to connectivity and its life-changing services. For example, as part of its Covid-19 mitigation measures, Ghana reduced the excise duty on mobile services from 9% to 5%, recognising connectivity as a basic service.¹⁶

To improve access to and use of connectivity, governments should reform mobile sector-specific taxation to improve affordability and incentivise investment in mobile networks. As part of successful reforms, governments should apply the best-practice principles of taxation recommended by international organisations such as the World Bank, IMF and OECD.

Examples of best-practice principles of taxation

- Taxation should be as broad based as possible
- Taxes should not discourage investment
- Specific taxes should be limited and based on a clear rationale of externalities
- The tax system should be equitable
- The tax system should be simple
- Taxes should not undermine the affordability of mobile services
- Taxes should be easy to collect

14. [Rethinking mobile taxation to improve connectivity](#), GSMA, 2019

15. [Reforming mobile sector taxation in the Democratic Republic of the Congo](#), EY, GSMA, 2018

16. [Ghana COVID-19 alleviation and revitalization of enterprises support](#), Ministry of Finance Ghana, 2020

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