GSMA

September 2025

Driving Digital Transformation of the Economy in Ghana

Opportunities, policy reforms and the role of mobile



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1. Executive Summary

Digitalisation is a key driver of economic growth with the potential to support Ghana in its pursuit of shared prosperity. Accelerating digital and technology transformation to deliver a "digitally inclusive and data-driven economy" is a central pillar of the agenda championed by H.E. President John Dramani Mahama and the Government's RESET agenda.[1] Initiatives by the Government and Ministry of Communication, Digital Technology and Innovations (MCDTI) include a review of the existing legislative and regulatory framework, developing a new National Digital Transformation and Emerging Technology Strategy and National Artificial Intelligence Strategy.[2]

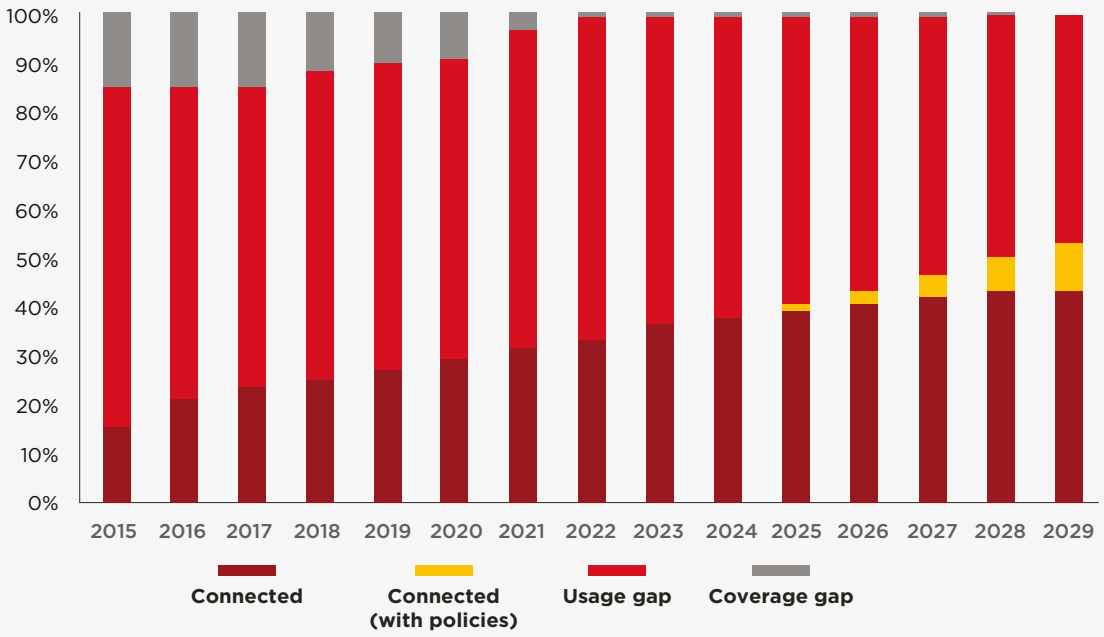
This study identifies opportunities for further digitalisation in Ghana and estimates the potential economic value that could be unlocked by adopting digital technologies across key sectors of the economy. It identifies how these opportunities can be supported through policy reforms in the telecommunications sector which play a critical role in the digitalisation process.

The telecoms sector in Ghana has made steady progress in recent years. However, bold policy actions are required to accelerate digital adoption, reduce the cost of supply and promote investment in both mobile money and mobile broadband services.

This report identifies key policy recommendations for consideration in the review of the regulatory framework and development of digital transformation and AI strategies by the Government and MCDTI. These policy reforms could close the usage gap from the current level of 62% of the population to 46% in 2029 - at which point, 54% of the population would be connected to the mobile internet marking a major milestone for Ghana's development (Figure 1).

1 National Broadcast on the occasion of the first 120 days in office by H.E. President Mahama, 7 May 2025.
2 Quarter 1 2025 Media Briefing: Ministry of Communication, Digital Technology and Innovations, April 2025.

Figure 1: Evolution of mobile internet connectivity in Ghana, subject to policy reforms



The priority policy reforms include:

- **Mobile tax reform.** Reduce sector-specific taxes on the mobile industry and mobile consumers, and maintain the government's recent decision to remove the E-Levy (on electronic money transfers) from April 2025. This will feed directly into lower retail prices which will boost adoption and usage of mobile broadband.
- **Infrastructure Investment.** Create a sustainable investment environment for digital infrastructure by implementing the following measures: publishing a spectrum roadmap that includes 5G spectrum, technology neutral licences and spectrum assignment, and a market-led approach to 2G and 3G network sunsetting; defining infrastructure deployment rules; providing increased access for Mobile Network Operators (MNOs) to connect sites to the electricity grid; promoting the security of mobile network infrastructure; reviewing the Quality of Service regulatory framework; and reforming the Universal Service Fund (USF). These reforms will improve the quality of service and lower costs which will feed through into increased mobile broadband adoption.
- **Demand-side policies.** These policies include measures to support device affordability, digital skills training programmes, digitalisation of government services and programmes to enhance the adoption of new technologies by businesses and consumers.
- **Regulatory modernisation.** Modernise the legal and regulatory framework to support further development of the sector, promote digital transformation and encourage the development and adoption of emerging technologies.

These policies will make a significant contribution to Ghana's strategic development objectives, including economic transformation in key sectors such as agriculture and manufacturing (Table 1).

Table 1: Impact of digitalisation of economic sectors in Ghana following policy reforms (in 2029)

	Agriculture	Industry	Trade	Transport	Government
Digital Value Add (million GHS)	10,500	15,000	5,100	4,300	5,800
% of sector GDP	3.3%	3.8%	1.6%	4.8%	2.3%
% of total GDP	0.7%	1.0%	0.3%	0.3%	0.4%
Employment	190,000	110,000	60,000	80,000	-
Tax Revenue (million GHS)	1,800	2,600	900	700	-



2. Digital Economy Framework

A. INTRODUCTION

The African Union's Agenda 2026 captures an aspiration for an integrated, prosperous and peaceful Africa, driven by its citizens and recognised as a global powerhouse. This rests on its member countries' commitment to inclusive and sustainable development.

Ghana faces many challenges in achieving this outcome. In recent years, macroeconomic instability has required the government to make difficult fiscal decisions that have, in the short-term, increased poverty and inequality. Such measures have also threatened to slow down Ghana's successful progress in digitalisation of the economy and public services.

Despite, these set-backs, Ghana remains committed to digitalisation as a driver of national development.[3] This is reflected in the government's digital strategies and programmes in accordance with the new government's RESET agenda which follows the earlier blueprints such as e-Transform 2013 – 2019 Project, the Integrated Digital Transformation Blueprint 2021 - 2027, and Digital Acceleration Plan 2022 – 2027, supported by the World Bank.

B. HOW DOES THE DIGITAL ECONOMY DRIVE DEVELOPMENT?

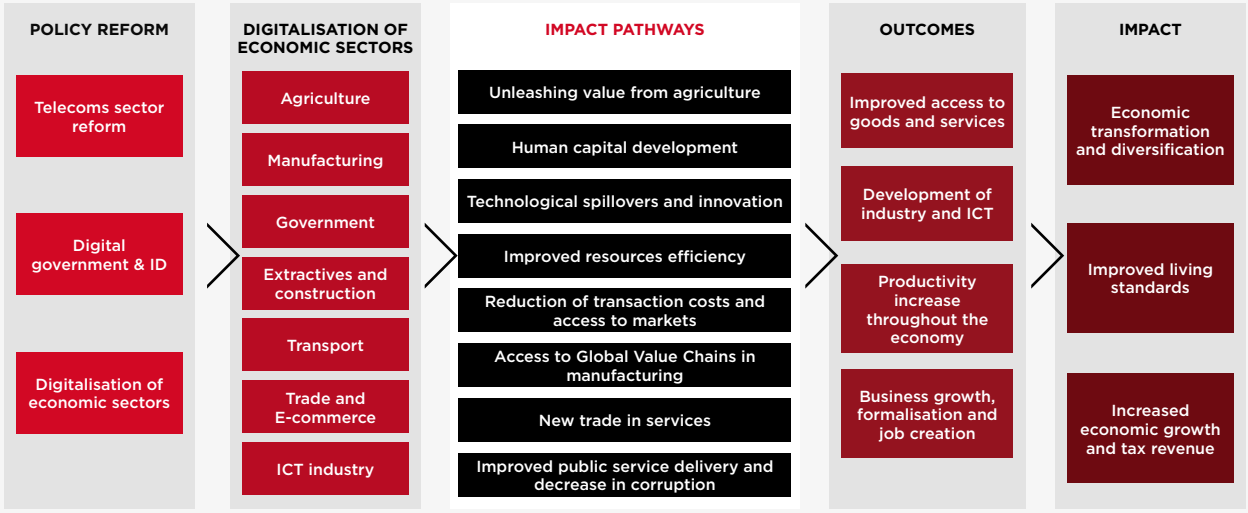
The process of digitalisation is continuing across Africa. Digital communications services are becoming more widely available, and their usage is continuing to grow. As a result, the services are getting more integrated into other sectors of the economy.

Mobile and ICT industries contribute significantly to the economy and public services in Ghana. Increased adoption of digital technologies across economic and public service activities enables more efficient use of resources. Therefore, the greatest impact of digital is felt in traditional sectors such as agriculture, manufacturing and retail; and public services such as government administration, education, and healthcare.

Adoption of digital technologies across the economy and in government increases the productivity of key sectors of the economy. Digitalisation increases value-addition in agriculture, improves access to Global Value Chains (GVCs), improves education and healthcare provision, reduces transaction costs in various economic and public service activities, and improves efficiency and transparency in the delivery of public services. Access to mobile money and other digital services promotes financial inclusion which supports human development.

3 Throughout this study, the term "digitalisation" is used to denote the adoption of new technologies by business and government across economic sectors. "Digital transformation" is the economic transformation resulting from such adoption. The "Digital economy" encompasses the actors and exchanges taking place in the economy as a result of digitalisation.

Figure 2: Digital pathways to economic transformation



Source: Synthesis of literature, Government's strategy, discussion with stakeholders

C. THE ROLE OF THE TELECOMS SECTOR IN THE DIGITAL ECONOMY

Mobile network operators provide a technology platform for citizens. Mobile provides broad-based access to information and communications services and enables digital delivery of many economic activities. This is particularly important in the provision of public services, reducing corruption and enhancing transparency which, in turn, increases availability and effectiveness of public funds. Mobile Financial Services (MFS) also play a critical role in economic development by expanding access to financial services, reducing transaction costs and supporting productivity improvements in other sectors.

The mobile sector is the foundation for the digital transformation of Ghana. This is recognised by the Government of Ghana's RESET agenda. It is also evident in the successful initiatives driven by previous programmes such as World Bank's e-Transform and the Ghana Digital Acceleration Plan (GDAP).

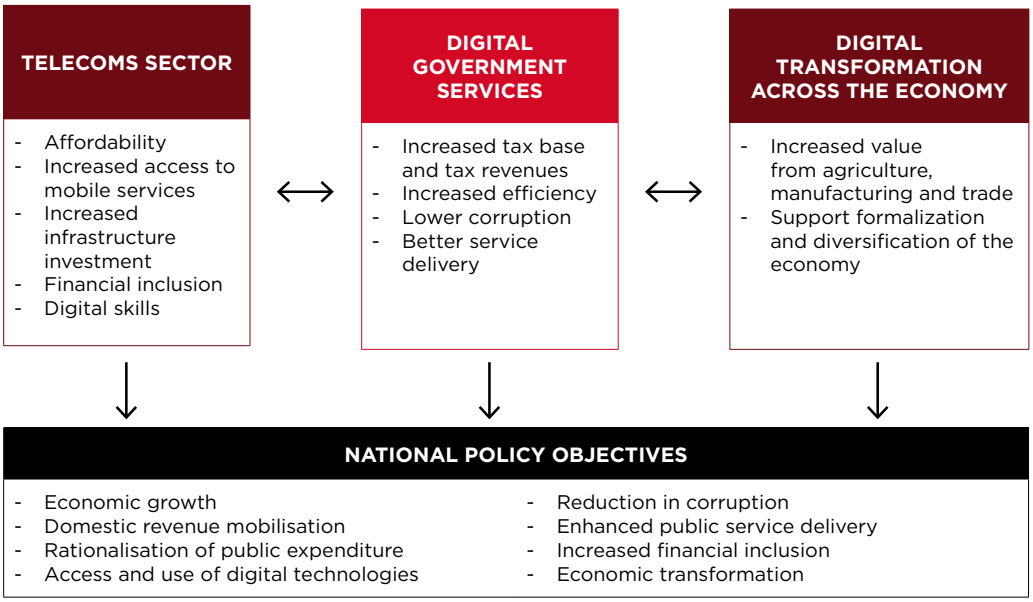
The mobile sector in Ghana will continue to play a key role as a strategic technology partner for the Government. This partnership requires a policy and regulatory framework that supports long-term sustainability of the industry and future investment in mobile infrastructure. This would build on recent gains in digital and financial inclusion, to accelerate digital transformation and the long-term technological advancement of Ghana as a digital hub for West Africa, ultimately delivering shared prosperity for all Ghanaians.

D. THIS STUDY

This study examines the role of digital technologies in the economic transformation of Ghana. The starting point is analysis of how digital technologies can drive socio-economic development through enhanced productivity, job creation, and how they can be used to improve government functions.

It identifies opportunities and quantifies the economic value of adopting digital technologies across key sectors of the economy. The report identifies how these can be unlocked through policy reforms in the telecoms sector which plays a foundational role in the process of digitalisation.

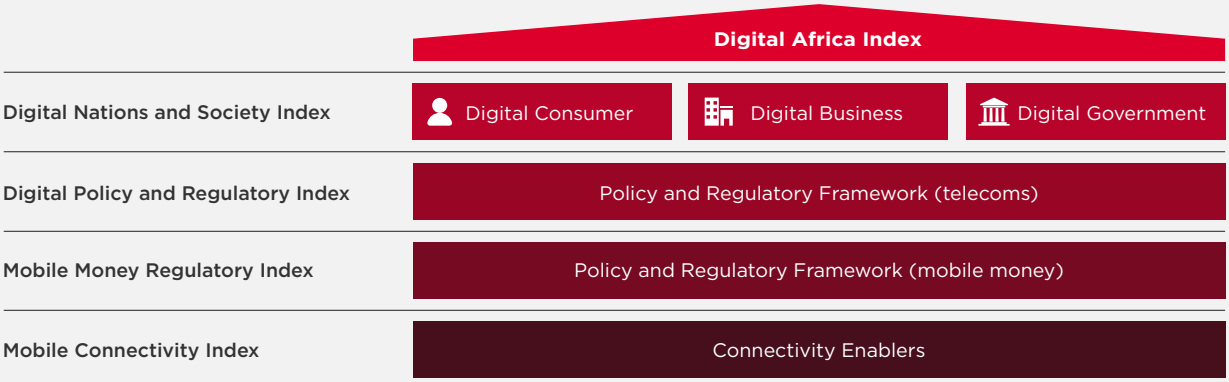
Figure 3: Digital Economy links to policy



Source: Authors' synthesis

The study is based on information provided by government, regulators, telecoms operators, industry and other stakeholders. It also incorporates publicly available data from national agencies and international organisations and the **GSMA's Digital Africa Index** (Figure 4).[4]

Figure 4: GSMA Digital Africa Index



The GSMA Digital Africa Index was first published in 2024 and includes a Digital Nations and Society Index and a Digital Policy and Regulatory Index. It complements other existing GSMA indices (notably, Mobile Connectivity Index and the Mobile Money Regulatory Index) in providing a comprehensive assessment of African countries' levels of advancement in integrating digital technologies into society and offering guidance on policy and regulatory interventions required to accelerate digital growth. The 2024 Digital Africa Index is the foundational version consolidating information provided by operators and regulatory authorities, public source information from national and international organisations, and other GSMA indices and research. This index will be updated in new iterations.

The **Digital Nations and Society Index** measures the adoption and usage of digital technologies by consumers, businesses and governments structured around 3 pillars and 15 indicators (Figure 5).

4 GSMA, Digital Africa Index and Methodology, 2024

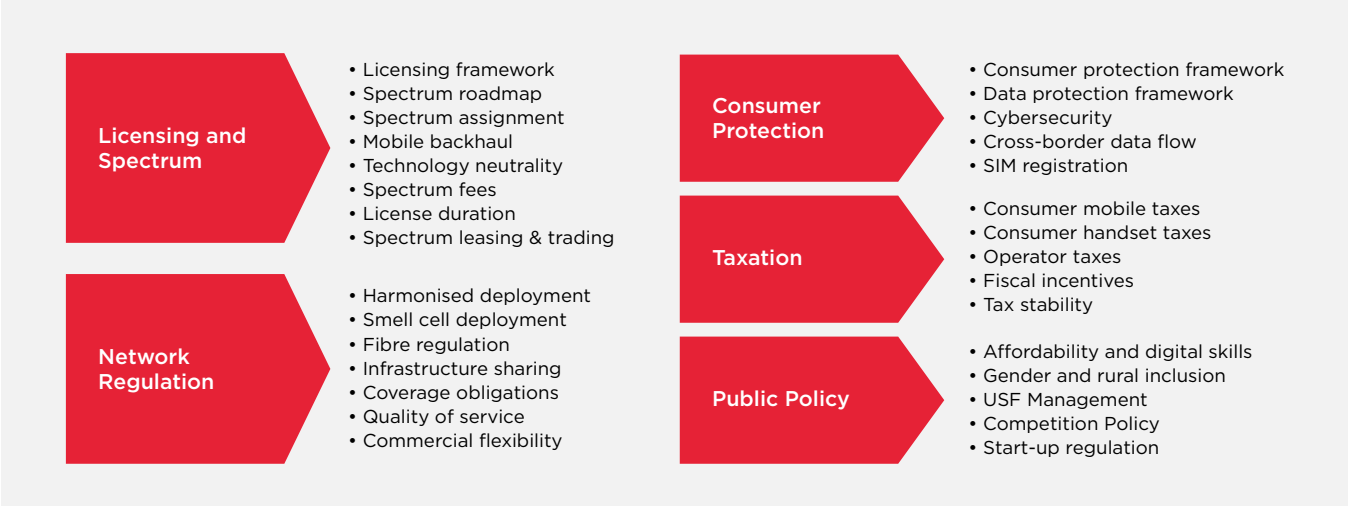
Figure 5: GSMA Nations and Society Index[5]

Digital Consumer	Digital Business	Digital Government
Mobile penetration	IoT penetration	Digital ID
Mobile internet penetration	Tech start-ups	E-Government Participation
4G/5G Smartphone adoption	Digital patents per capita	Digital Health
Mobile data usage	Mobile commerce	G2P/P2G
Digital financial services	Firms with website	GovTech Maturity
	Micro-entrepreneurs mobile adoption	Schools with internet
	Micro-entrepreneurs mobile internet adoption	

Source: GSMA

The **Digital Policy and Regulatory Index** assesses policy levers for governments in driving digital investment and inclusion. It is structured around five pillars and contains 30 indicators (Figure 6).

Figure 6: GSMA Digital Policy and Regulatory Index



Source: GSMA

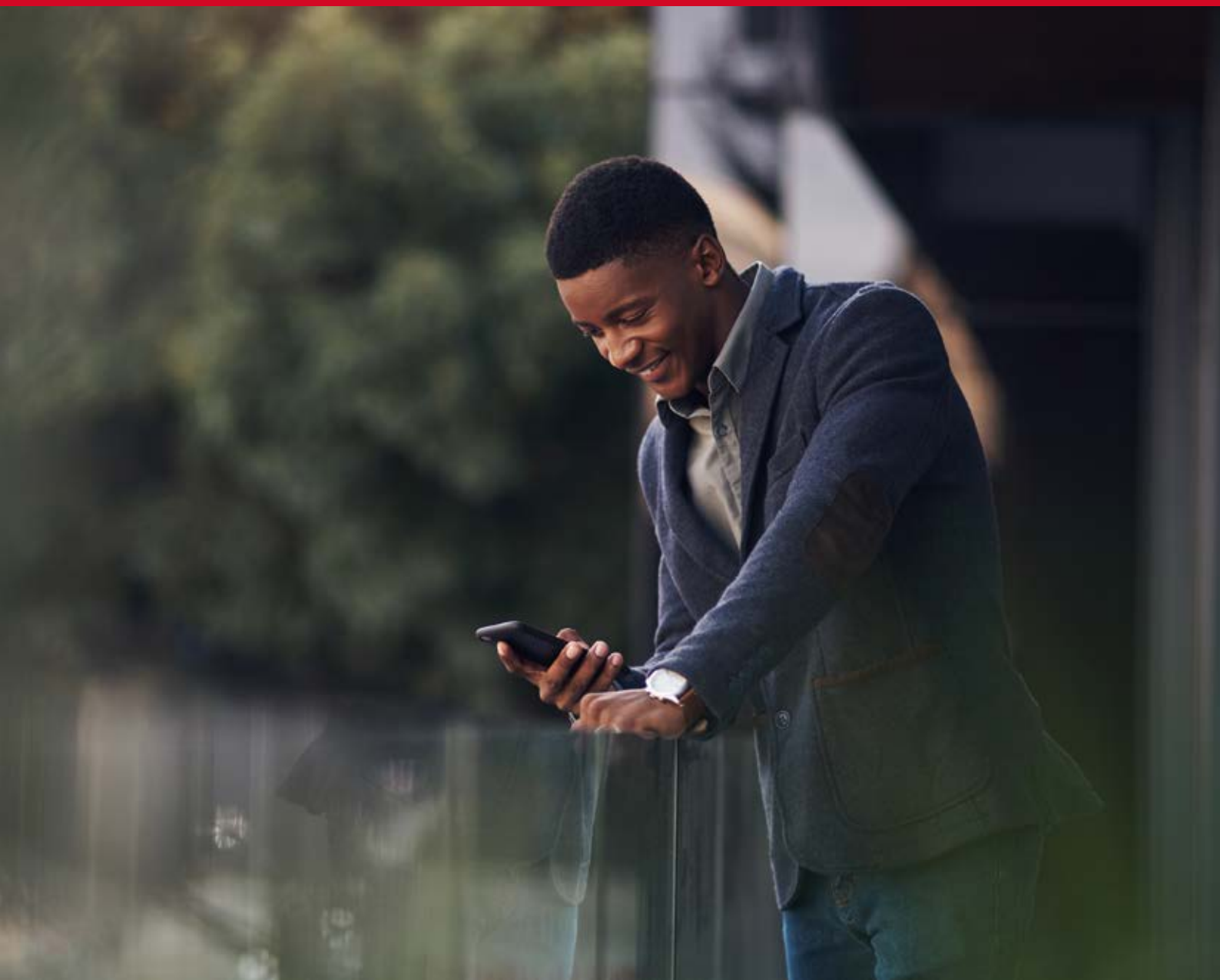
Subsequent sections of this report is organised as follows:

- Section 3 discusses digitalisation of the economy of Ghana and explores how it impacts productivity, growth and job creation. For each key sector of the economy, the potential economic impact of digitalisation is estimated based on policy recommendations detailed later in the report.
- Section 4 focuses on the telecoms sector, assesses how the sector is performing in terms of infrastructure, access, adoption of both digital communications and mobile financial services. It identifies key policy challenges and quantifies impacts of some policy reform scenarios.
- Section 5 outlines key policy reforms that the government could undertake to unlock the catalysing role of the mobile industry for digital transformation.

5 GSMA Digital Africa Index Presentation. Note from the GSMA: There is insufficient data on the indicators in grey to include in the DNSI. However, given their importance, data on the DAI web platform is included where it is available. As more data is gathered, this will be fully incorporated into the index.


BLACK STAR SQUARE

3. Digital Transformation in Ghana



A. GHANA COUNTRY SNAPSHOT

Ghana is the second most populous country in West Africa and has been classified as a lower-middle-income country since 2010.[6] It is rich in industrial minerals, hydrocarbons and precious metals, in addition to being the second largest producer of cocoa globally. Its main exports are gold (which accounted for 57.2% of exports in 2023), crude oil (18.7%) and cocoa (4.7%).[7]

The country has faced numerous economic challenges in recent decades. Ghana has experienced recurring cycles of boom and bust, characterised by macroeconomic instability followed by structural reforms including public debt restructuring, fiscal consolidation, and monetary policy tightening. The country has also perennially faced the challenges of creating sufficient high-quality jobs and boosting long-term productivity growth. The onset of oil production in the 2010s increased the share of GDP generated by the extractives sector. Productivity growth in this area has been highest. Productivity in services, Ghana's largest employment generator, has stagnated while productivity in manufacturing has declined.[8]

Table 2: Ghana – Key Indicators

Gross Domestic Product (current GHS)	842 billion
Gross Domestic Product (current USD)	76 billion
GDP growth (annual %)	2.9%
GNI per capita (Atlas method, current USD)	2,360
Infant mortality rate (per 1,000)	28.2
School enrolment, primary (% gross, 2022)	97%
Life expectancy (years)	65.5
Population, of which % rural pop	33.8 million, 41%
Net ODA received (% of GNI, 2022)	1.43%
Mobile internet unique subs (2024)	13 million
3G Network Coverage (% Pop, 2024)	99.5%
Financial account ownership (% adults, 2021)	68%

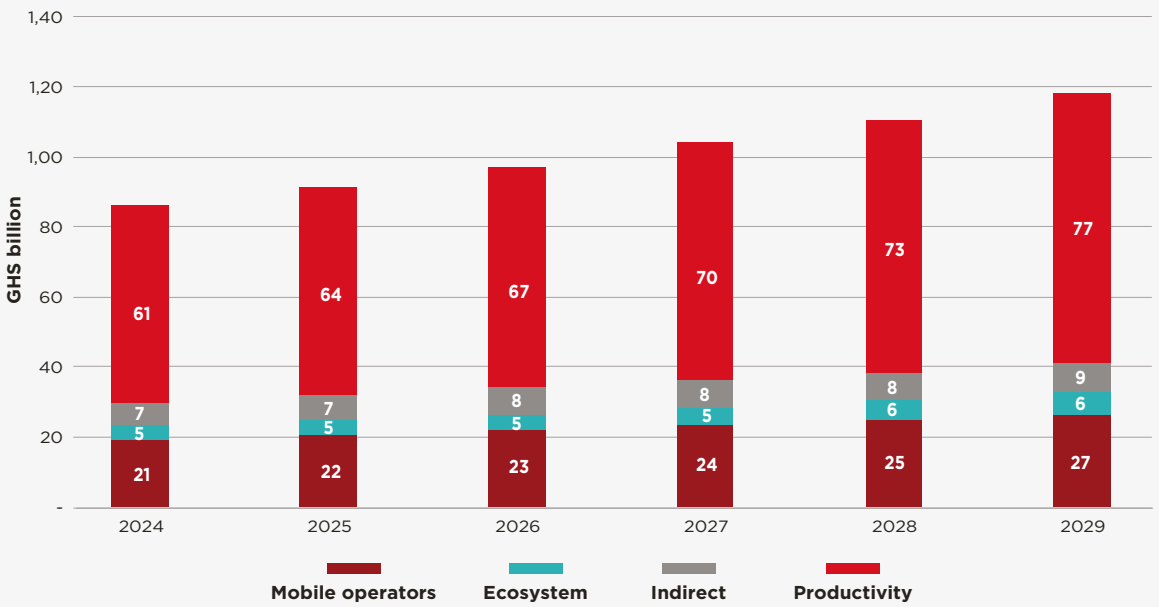
2023 Data, unless stated otherwise.

Source: World Bank World Development Indicators, GSMA, World Bank Global Financial Inclusion Database.

Mobile services, and digital technology more broadly, have delivered far-reaching economic and social benefits in Ghana. Continued investment in the country's telecoms infrastructure has laid the foundations for a vibrant technology ecosystem. As a result, the mobile industry overall makes a significant contribution to the economy of Ghana. Considering direct and indirect contributions of the mobile ecosystem, as well as the productivity impact throughout the economy, its contribution to GDP in 2024 is estimated at GHS 94 billion, equivalent to 8% of GDP (Figure 7). In addition, the Ghana Chamber of Telecommunications estimates that the sector made GHS 9.83 billion in tax payments, equivalent to 1.22% of national GDP and over 43% of industry revenues.[9]

6 World Bank country classifications.
7 https://oec.world/en/profile/country/gha.
8 World Bank,Ghana Rising: Accelerating Economic Transformation and Creating Jobs, 2021.
9 The total GDP contribution is based on GSMA, Mobile Economy Africa, 2023 and extrapolation to Ghana's economy. The total tax contribution is taken from the Ghana Chamber of Telecommunications' Mobile Industry Transparency Initiative 2023.

Figure 7: Direct, indirect and productivity impacts of mobile in Ghana, GHS billion

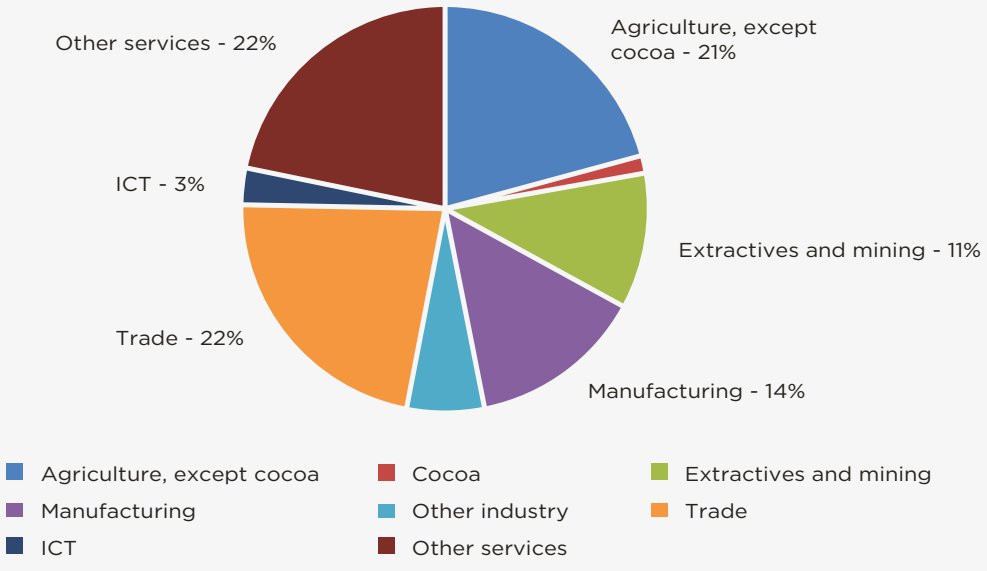


Source: GSMA Mobile Economy SSA, IMF WEO and authors calculations. GDP at constant 2024 GHS.

B. THE ECONOMY OF GHANA

Agriculture has historically played a major role in the economy of Ghana. However, the importance of services and extractives has risen in recent years, particularly since the discovery of commercially viable quantities of oil in 2007.[10] Agriculture is still the driving sector of the economy, accounting for 22% of GDP in 2024. Industry accounts for 31% of GDP, including 14% from extractives and mining, while services represent 47% of GDP. Agriculture employs 41.8% of the labour force, industry 17.4% and services 40.2%.[11]

Figure 8: Composition of GDP by sector, 2024

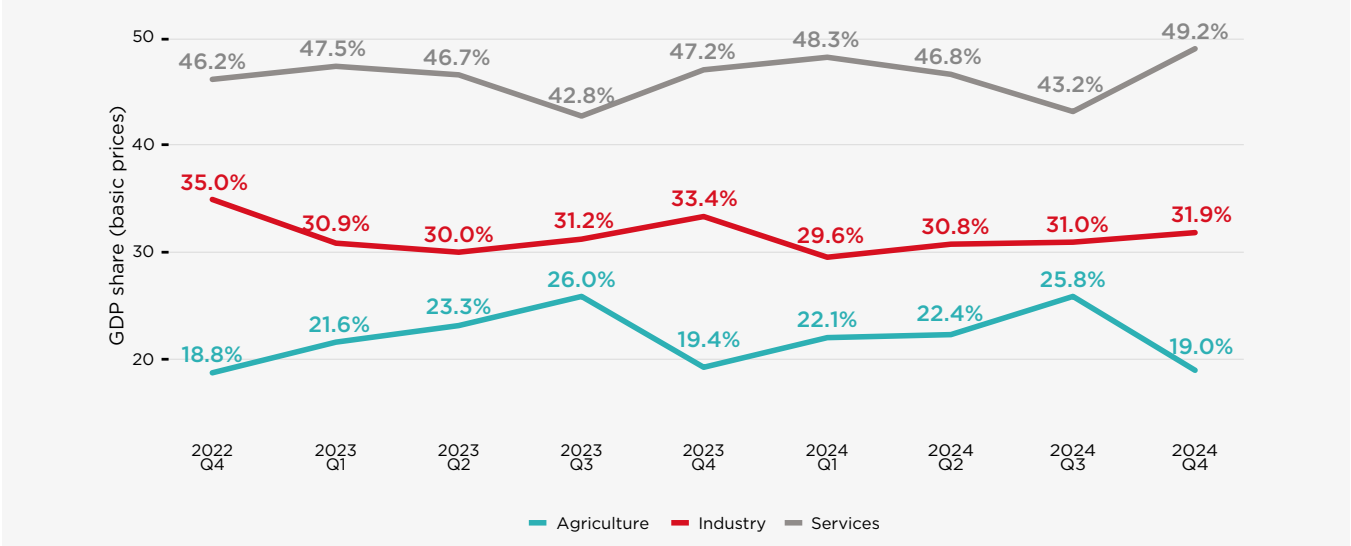


Source: Ghana Statistical Service.

10 UNU-Wider Economic Transformation database.
11 ILO Labour Statistics, data for 2017.

All key sub-sectors within the Industry category have recorded growth in the past decade. Over the years, contribution of the manufacturing sub-sector has increased significantly, with extractives growing from a value of GHS 15 billion in 2013 to over GHS 152 billion in 2020. Despite these achievements, challenges regarding the cost of doing business, energy supply, and macroeconomic environment persist.[12] More recently, GDP recorded strong growth from services in Q4 2024, while the industrial sector remained stagnant and agriculture contracted.[13]

Figure 9: Evolution of GDP by sector



Source: Ghana Statistical Service, Statistical Newsletter Q4 (October to December) 2024

C. GHANA ECONOMIC STRATEGY

The first budget statement delivered by the administration of President John Mahama was delivered in March 2025 under the theme of "Resetting the Economy for the Ghana We Want".[14] Past cycles of sovereign debt defaults have resulted in Ghanaian authorities approaching creditors to resolve underlying solvency issues. As part of these interventions, the Government of Ghana adopted an economic program focused on fiscal consolidation and increasing tax revenues. The recent budget noted that, despite the gains made under the IMF-supported programme since the start of its implementation in May 2023, the economy is still fragile, with significant debt arrears outstanding.[15]

In this context, the Government intends to implement key policy interventions to support economic transformation and the job creation agenda. This includes expenditure of an equivalent of USD 10 billion on strategic infrastructure development, underpinned by structural reforms to promote modernised agriculture, agri-business and value addition for import substitution, exports and job creation.[16]

Digital (and technological) transformation for a "digitally inclusive and data driven economy" is a central pillar of the Government's RESET agenda. Current digital-related initiatives by the Government and the MCDTI are summarised below in Table 3.[17]

12 Government of Ghana, National Development Policy Framework 2022-2025.
13 World Bank, Macro Poverty Outlook 2023.
14 The Budget Statement and Economic Policy of the Government of Ghana for the 2025 financial year.
15 2025 Budget Statement and Africa Confidential, Mahama plans clash with IMF strictures, March 2025.
16 2025 Budget Statement and President Mahama's manifesto.
17 National Broadcast on the occasion of the first 120 days in office by H.E. President of Ghana, 7 May 2025; Quarter 1 2025 Media Briefing Ministry of Communication, Digital Technology and Innovations, April 2025; Press Statement by the Minister of Communication on the current state of data prices in the country, 10 June 2025.

Table 3: Summary of digital actions and initiatives under the Government's RESET agenda

Job creation & digital skills	The One Million Coders Programme aims to provide one million young Ghanaians with digital skills training, empowering them to thrive in growing Business Process Outsourcing (BPO) and Knowledge Process Outsourcing (KPO). Pilots in Greater Accra, Ashanti, Bono and Upper East Regions have been launched. Under the guidance of the MCDTI, the Ghana-Indian Kofi Annan Centre for Excellence in ICT has developed a standardized digital skills curriculum. MCDTI and MTN Group have signed a memorandum of understanding with the government, alongside other agreements with partners, focused on transforming Ghana into Africa's premier digital hub.
Taxation	In April 2025, the Electronic Transfer (E-Levy), Emissions Levy, and Betting Tax was repealed. The government has agreed with multinational partners to include the COVID levy, which is linked to the existing IMF programme, in a VAT rationalisation exercise scheduled for September 2025. The government is also undertaking a comprehensive tax review ahead of the 2025 Mid-Year Budget review and the 2026 Budget.
Affordable internet access	In February 2025, the MCDTI's Multistakeholder Data Cost Pricing Committee developed a roadmap to implement more cost-effective data. On 10 June 2025, the Minister of Communication, Digital Technology and Innovation announced the following measures by MNOs and the National Communication Authority (NCA) from 1 July 2025: • Airtel Tigo Ghana (AT) introduced a 10% increase in all data bundles, with the GHS 400 bundle increasing from 195GB to 236GB. • Telecel Ghana to introduce a 10% increase in all data bundles, with the GHS 400 bundle increasing from 190GB to 250GB. • MTN Ghana introduced a 15% increase in all data bundles, with the restoration of the GHS 399 social media bundle increasing from 27GB to 214GB and replacing the GH 350 Flexi bundle which offers 92GB. • NCA to monitor strict implementation of 1 July measures and to undertake quarterly reports on billing integrity of mobile data services to the MCDTI.
Quality of Service, technology neutrality and spectrum	MCDTI has approved policy decisions on technology neutrality and additional spectrum to MTN and Telecel to improve their service offerings. On 10 June 2025, the Minister of Communication, Digital Technology and Innovation stated the intention to sell spectrum. The Minister also announced that operators had been mandated to make critical investments in their networks to improve quality of service in the next quarter (July – September), that NCA will commence a rigorous quality of service assessment in the final quarter (October to December) of 2025, and that the operators had committed to invest approximately USD 150 million in their networks by the end of the year.
Regulatory framework review and new digital strategy	MCDTI has initiated a review of the existing legislation and regulatory framework to provide a transparent, enabling environment for innovation, investment, and consumer protection. MCDTI has convened a National Entrepreneurship and Innovation programme, which has a clear roadmap for finalising the Ghana Innovation and Startup Bill. MCDTI has commenced developing a new National Digital Transformation and Emerging Technology Strategy and a National Artificial Intelligence Strategy and blueprint.

Universal Service	MCDTI has directed the Ghana Investment Fund for Electronic Communications (GIFEC), the Universal Access Fund, to undertake an asset inventory of infrastructure to ensure 3,600 centres are used to deliver digital government to Ghanaians and the Rural Telephony project is completed to connect an additional 4 million Ghanaians. MCDTI has begun the legislative process to evolve GIFEC into the Digital Economy and Innovation Development Fund.
Cybersecurity	MCDTI has instructed the Cyber Security Authority to improve digital surveillance and monitoring. MCDTI is also preparing legislation on public mis(dis)information law enforcement.
SIM Registration & Central Equipment Identity Register	MCDTI is working with authorities and MNOs on "human-centric and technology driven" processes.

These initiatives build on digital transformation programmes by previous administrations and multistakeholder partnerships. These include the Cares Programme and the World Bank funded e-Transform and Ghana Digital Acceleration Programme (GDAP) programmes. These programmes included the following initiatives: [18]

- Improvement of the business environment and export competitiveness.
- Fast-tracking implementation of key growth-oriented programs (e.g. agribusiness and value chains).
- Digital government programs that aim to contribute to improvements in economic productivity and service delivery.
- Initiatives to digitise fiscal revenue collection, to support a cashless society, increase transparency and revenue mobilisation.
- Promotion of entrepreneurship to support private sector development.
- Promotion of increased digital literacy and support to Ghanaian technology entrepreneurs to build tech hubs and export IT-enabled services such as BPO.
- Expansion and improvement of internet connectivity.

Ghana's progress on digitalisation is reflected in its high ranking among African countries in the International Telecommunications Union (ITU) ICT Development Index 2024. Its index score is 66.2 compared with South Africa (83.6), Botswana (78.7), Kenya (58.5), Nigeria (46.9) and Rwanda (46.8)[19] **It also performs well in the GSMA Digital Nations and Society Index.** Ghana's overall index score is 41.43 based on good performance on digital government and digital consumer indices with further progress required on digital business index, compared with overall index scores of South Africa (66.92), Kenya (51.04), Botswana (39.36), Rwanda (35.71) and Nigeria (34.2).

18 Ghana Cares programme (https://www.ghanacares.gov.gh/). IMF, Ghana: Request for an Arrangement Under the Extended Credit Facility-Press Release; Staff Report; and Statement by the Executive Director for Ghana, 17 May 2023.

19 ITU Digital Development Index 2024, p4–5.

D. THE ECONOMIC IMPACT OF DIGITALISATION IN GHANA

This section estimates the macroeconomic impacts of digitalisation in Ghana for each key sector of the economy, based on academic and policy research and official economic data. Each impact is articulated through digital pathways to economic transformation and considers the Government's RESET agenda (as outlined to date). It ultimately estimates key economic outcomes such as productivity growth and job creation.

The policy objectives, impacts of digitalisation by sector and their relationships are mapped in the table below, as well as the evidence for quantifying them. More details on the methodology and evidence review are contained in the separate methodological document that accompanies this report.

Table 4: Mapping digitalisation to policy objectives and estimating its impact

Sector	Policy objectives	Outcomes of digitalisation	Impact relationship	Evidence rule
Agriculture	Agricultural development and boosting agricultural productivity, access to markets, increase and diversified production	Precision agriculture, targeted information, better access to markets	Access to technology by farmers will boost productivity, profits	Access to technology and precision agriculture increase crop yields between 10.5% and 20%, and profits up to 23%
Manufacturing	Diversify and develop manufacturing, attract Foreign Direct Investment (FDI), increase technology exports	Expand manufacturing capabilities, diversify production, increase FDI and exports	Adoption of new technologies by firms will enhance productivity, GDP, exports	Application of industrial Internet of Things (IoT) and Industry 4.0 increases value-add between 15-25%
Transport	Improve trade links, infrastructure for transport and logistics, strengthen ports' competitiveness	Reduce transaction and logistics costs, border delays and tax leaks. Increases productivity and integration in GVCs	Digital platforms and infrastructure can increase productivity, port capacity, GDP	Transport upgrades increase incomes by 10%. Digitising ports reduces logistics costs by 15-25%. Digital customs increase revenue by 54% in 5 years
Trade	Economic diversification, strengthen trade and exports	Improves trade flows, growth of e-commerce and exports of ICT services and digitally delivered services	Digital trade boosts and and increased integration in the African Continental Free Trade Area (AfCFTA), e-commerce and service exports	Potential to increase e-commerce value to 15% GDP and ICT exports value to 7% GDP
Micro, small, amd Medium IMSMEs	Strengthening competitiveness and formalisation of MSMEs	Improves profits of MSMEs. Facilitates business registration, access to finance, formal contracts	Access to digital by MSMEs will increase incomes and formalisation	Technology adoption is associated with labour productivity of 2-4% for small firms
Government	Strengthen domestic revenue mobilisation, prevent corruption, improve services delivery	Increases tax revenue and provides saving in public expenditure through better targeting, transparency and reduction of corruption	Mobile money, Person-to-Government (P2G), Government-to-Person (G2P) adoption could increase GDP, tax revenue, reduce leakage	Mobile money adoption increases tax revenue by 7-17% on average. Digital ID for social protection decreases leakage by 41-47%

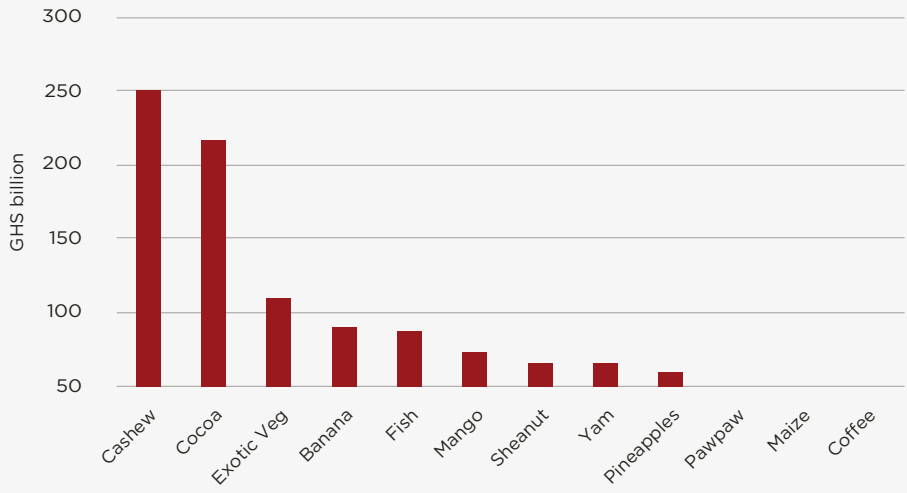
For details and references see the methodology document that accompanies this report: GSMA, Driving Digital Transformation for African Economies, 2024.



Impact of digitalisation on the agricultural sector in Ghana

Agricultural production and exports are highly concentrated in Ghana, with cashew and cocoa representing 35% and 30% of agricultural export value, respectively.[20] The Government aims to diversify and expand agricultural production, and to enhance agricultural production systems by leveraging science, technology and innovation. This includes measures to increase the proportion of farmers using modern agriculture technologies.

Figure 10: Agricultural exports, 2020, value in GHS billion



Source: National Development Policy Framework 2022-2025

Digitalisation supports diversification of food crop production, as well as improving agricultural productivity. Both of these can be achieved through information and training tools online, real-time information on crops and weather patterns and precision agriculture delivered with digital tools. Increased access to regional markets can also be facilitated by digital agricultural exchanges and supporting MSMEs in providing services to commodity value chains.

Digitalisation has the potential to reduce food waste by improving post-harvest management through digital tracking and information systems. This could reduce the loss of harvest in fruits and vegetables, which amounts to 8% of total food output, equivalent to GHS 60 million.[21]

20 Government of Ghana, National Development Policy Framework, 2022-2025.
21 Ibid.

Box 1: Digital agriculture case studies

Digitising the agricultural last mile in Ghana: MTN Mobile Money's mAgric

MTN Mobile Money piloted mAgric, a mobile-based tool that enables the digitisation of the entire procurement process in the agricultural last mile. mAgric supports farmer registration and mobile money payments from agribusinesses to farmers, as well as data analytics and monitoring for agribusinesses.

By digitising value chain payments via mobile money, the tool serves as an entry point for financial inclusion for unbanked farmers. mAgric currently targets farmers in the cocoa value chain, Ghana's most important cash crop and second largest export commodity. MTN Mobile Money is looking to expand the tool to more value chains and farmers.

Source: https://www.gsma.com/mobilefordevelopment/resources/digitising-the-agricultural-last-mile-in-ghana-mtn-mobile-moneys-magric/.

MTN partnership with Vegetable Centre of Excellence

MTN Ghana has partnered with the University of Ghana and smart agronomic service provider Defarmercist, a GHS 3 million initiative to establish a Vegetable Centre of Excellence at the University. The initiative seeks to empower young people through vocational agriculture training and equip them with practical skills to venture into agribusiness as part of broader efforts to reduce youth unemployment. The pilot phase of the project is expected to train at least 300 young people over the next two years.

Source: Business & Financial Times online article "MTN, UG launch GH¢3m project to empower youth

Further digitalisation of agriculture has the potential to inject GHS 10.5 billion to agricultural value-addition, equivalent to 3.3% of the sector's total value-add by 2029. This could result in an additional 190,000 jobs by 2029 and GHS 1.8 billion in additional tax revenues.

Table 5: Impact of digital policy reforms on agriculture in Ghana in 2029

Digital value add (GHS Million)	10,500
% of sector GDP	3.30%
% of Total GDP	0.70%
Employment	190,000
Tax revenue (GHS million)	1,800

Constant 2024 GHS. See methodological document that accompanies this report.

Impact of digitalisation on industry in Ghana

Despite investment and productivity improvements across much of the industrial sector in Ghana, economic growth has mainly been driven by the extractives sector. The Government recognises the need to diversify and increase industrial production, increase research and development, and technology spending and to promote food system transformation through local processing and value-addition.

There is large potential for Ghanaian firms to benefit from technology. Industry 4.0 technologies could benefit firms by adopting advanced digital technologies such as cloud computing (which is currently used by less than 31% of firms), 3D-printing and big data analytics or AI (currently used by 4.6% of firms).[22] The extractive industries could also benefit significantly. Digitalising mining processes can increase tax revenues and other benefits. Digitalisation can also support more effective linkages of the extractive sector with the rest of the economy.

22 World Bank,Ghana Rising: Accelerating Economic Transformation and Creating Jobs, 2021.

Mining yields can be increased by up to 10% through adoption of IoT and other digital technologies. This can represent a substantial gain as Ghana has 14 large-scale mines in operation, including 12 gold mines, one bauxite mine and one manganese mine. Together, they represent GHS 43.9 billion in value-add to the economy and provide over GHS 2.8 billion in tax revenue.

Box 2: Digital industry case studies

Powering African Mining's Future with 5G Private Networks

5G private networks can unlock immense potential for safer, more efficient, and sustainable mining operations. MTN is collaborating with industry leaders like Huawei, Minetec, and Nulitics, to develop specific solutions for the mining industry. This deployment has been expanded from South Africa's Phalanndwa colliery, the first 5G-powered mine, to multiple sites in Africa.

5G networks in mines maximise operational efficiency through real-time data transmission and remote monitoring by skilled personnel. They enable precision automation through sensors, autonomous vehicles and machinery, and optimisation of production through efficient data collection, analysis and enhanced decision-making. The integration of AI-powered analytics means that machine downtime and equipment failures are minimised.

Source: https://www.miningweekly.com/article/powering-african-minings-future-with-5g-private-networks-2024-02-05.

Smartgrids and drones in electricity network

The Electricity Company of Ghana has deployed 15 drones to monitor its networks. Drones and AI are rapidly becoming vital tools in the operations of transmission and distribution utilities because of their ability to provide access to difficult locations on powerlines for purposes of carrying out inspections without creating outages.

Source: https://www.smart-energy.com/industry-sectors/energy-grid-management/drones-to-monitor-ghanas-electricity-networks/

Digitalisation of the industrial sector has the potential to increase industry value-add by GHS 15 billion, equivalent to 3.8% of the sector's total value-add, by 2029. This could result in about 110,000 additional jobs and GHS 2.6 billion in additional tax revenues by 2029.

Table 6: Potential impacts of digitalisation of Ghana's industry (2029)

Digital value add (GHS Million)	15,000
% of sector GDP	3.80%
% of total GDP	1.00%
Employment	110,000
Tax revenue (GHS million)	2,600

Constant 2024 GHS. See Methodology Document that accompanies this report.

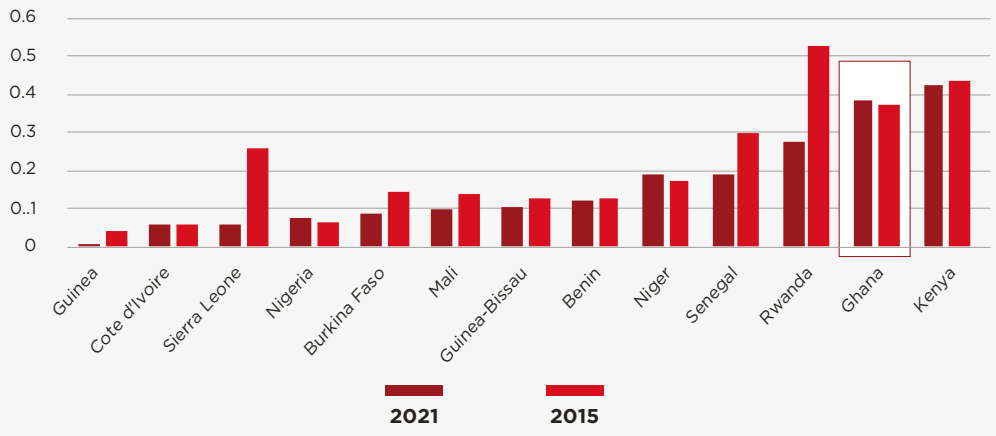


Impact of digitalisation on trade in Ghana

Ghana's exports are highly concentrated in primary commodities and a few food staples. Digitalisation brings opportunities to expand value-addition from trade. It could enable the country to improve trade facilitation by taking full advantage of multilateral agreements such as the African Continental Free Trade Area (AfCFTA), the Economic Community of West African States (ECOWAS) Common External Tariff (CET), the African Growth and Opportunity Act (AGOA), and the EU-ECOWAS Economic Partnership Agreement (EPA). [23]

Digitalisation supports the growth of Ghana's trade in services. Services currently represents less than 40% of total exports but can get to as high as 50% as in some African countries (Figure 11). Adoption of new technologies can expand the tradability of some services and enable growth in digitally-delivered services. The services sector could drive structural change in Ghana, contributing to productivity growth and job creation.[24]

Figure 11: Exports of services, % of GDP

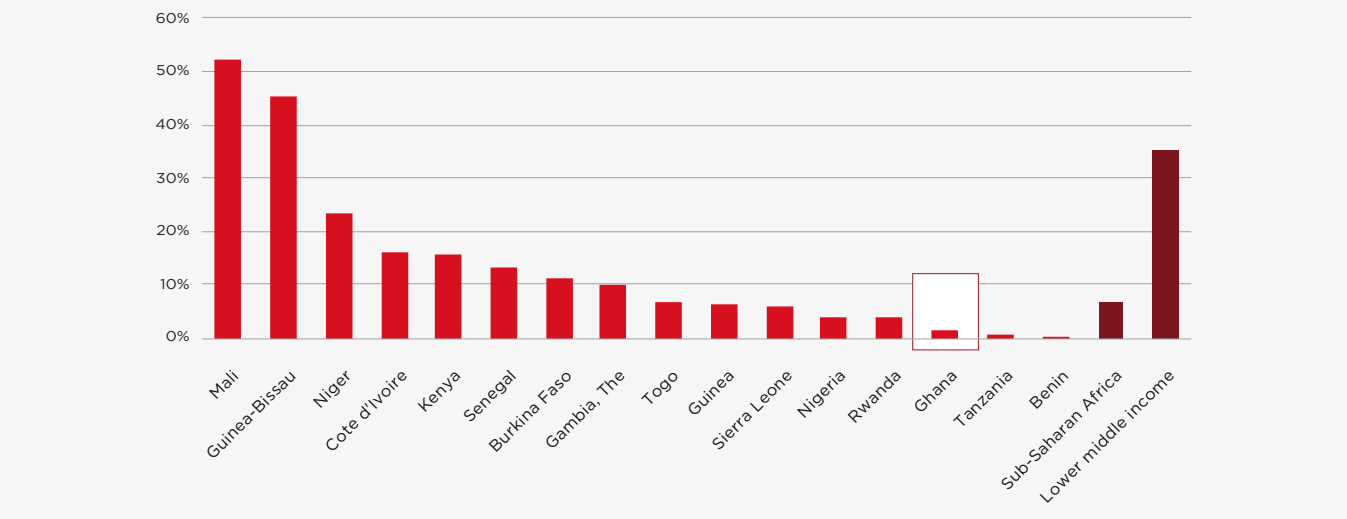


Source: World Development Indicators.

23 Government of Ghana, National Development Policy Framework 2022-2025.
24 World Bank, World Development report 2020.

The share of ICT in total services exports has the potential to grow. Currently, ICT only accounts for 1.6% of total service exports, much lower than in some other African countries (Figure 12). Such growth in ICT services exports could result from growth in digital payment services, e-commerce and reduction of barriers to cross-border digital trade.

Figure 12: Information and communications technology exports as % of total services exports



Source: World Development Indicators.

Digital technologies can also increase access to cross-border trade in goods and services, taking advantage of the AfCFTA. Cross-border e-commerce is a driver of digitally-enabled trade in goods and services. As of 2023, the penetration rate of Ghana's e-commerce market stood at 12.5% and is projected to grow to nearly 17% by 2028.[25] To enable growth in e-commerce and support increased trade, regulation of cross-border data flows will need to be carefully considered. In particular, localisation requirements need to be set to the minimum necessary to achieve essential policy objectives in ways that minimise restrictions to trade.[26] Such growth in cross-border e-commerce will support diversification of Ghana's economy and deepen economic cooperation in the sub-region.

Digitalisation will help support the Government's initiatives to support business productivity. It increases productivity of both informal and formal firms and encourages informal firms to shift towards formalisation. Digital technologies can be used to support the Government's RESET agenda, including initiatives targeted at MSMEs, such as Ghana Enterprise Agency's High Growth Programme. They enable better targeting of beneficiaries and enhance business advisory services such as training, advisory, counselling and extension services.[27]

25 www.statista.com/topics/10270/e-commerce-in-ghana/#topicOverview.
26 WTO, IMF, Digital Trade for Development, 2023.
27 Government of Ghana, National Development Policy Framework 2022-2025.

Box 3: Digital tourism case study

Catalysing the use of data and digital technology for tourism in Ghana

Data and digital technology can provide tourism operators with valuable tools such as digital marketing, cashless payments and data analytics to enhance their reach and improve the tourist experience and service offerings.

The Visit Ghana App was created to provide a harmonised platform for tourism services. It supports three key functions: enhancing the tourism levy collection process, automating Ghana Tourism Authority processes, and promoting Ghana as an attractive tourism destination.

Source: https://ghana.travel/project/the-visit-ghana-app/ ; https://cenfri.org/articles/catalysing-data-and-digital-technology-for-tourism-in-ghana/

Digitalisation of the trade sector has the potential to add GHS 5.1 billion in value-add, equivalent to 1.6% of the value added by the sub-sector by 2029. This would result in over 60,000 additional jobs in trade by 2029 and GHS 900 million in additional tax revenues.

Table 7: Potential impacts of digitalisation of trade in Ghana (2029)

Digital value add (GHS million)	5,100
% of sector GDP	1.60%
% of total GDP	0.30%
Employment	60,000
Tax revenue (GHS million)	900

Constant 2024 GHS. See methodological document that accompanies this report

Impact of digitalisation on the transport sector in Ghana

Ghana is a leader in West Africa on transport, logistics and trade-related infrastructure. Productivity in transport services has increased by 48% over the past three decades while maritime and container cargo volume grew by 7.6% annually on average between 2010 and 2020.[28]

There is potential to grow the share of container traffic and volumes, modernise freight transport and improve logistics to position the country as a regional logistics and transport hub. For example, Ghana is in the bottom third of countries in the Logistics Performance Index (LPI), with potential to improve on all dimensions, including customs procedures and tracking and tracing – both of which can be supported by digitalisation.[29]

Modernising and improving transport links through adoption of digital technologies would enhance trade links to the sub-region and integration into ECOWAS and AfCFTA. It could reduce transaction and logistics costs, increase productivity and integration in global value chains and improve access to global markets. For example, welfare gains from road and border investments in West Africa are estimated to amount to almost 10% of real income, when road upgrades are complemented by reduced border delays.[30]

Government programmes are targeting a 45% increase in container traffic and a 50% increase in maritime volumes in five years.[31] The establishment of a digital port information system and digitalising border procedures could reduce border delays, customs duty and tax leaks, and enhance competitiveness of the Tema and Takoradi ports through quicker turn-around times and higher volumes.

28 World Bank,Ghana Rising: Accelerating Economic Transformation and Creating Jobs, 2021.
29 World Bank, Logistics Performance Index, 2023.
30 World Bank, Policy Research Working Paper 9855, Corridors without Borders in West Africa, Mathilde Lebrand, 2021.
31 Government of Ghana, National Development Policy Framework 2022-2025.



Digitalisation can further contribute to enhanced safety and security for all categories of road users. For example, an automated platform has been established at the Drivers and Vehicles Licensing Authority to ensure an effective and efficient system to reduce fraudulent practices and revenue leakage, and to guarantee efficient and speedy delivery of services.[32]

Box 4: Digital port case study

Paperless port system prompts import revenue growth in Ghana

In 2017 the GRA implemented a paperless port clearing system to manage import flows in Ghana's main ports via an online system, where traders can obtain required import licences, permits and certificates as well as pay relative fees and charges.

After one year of implementation, the GRA reported a 3.9% increase in import revenue directly attributable to the new system. Moreover, it reduced the time to clear goods from weeks to a few hours. Additional improvements to the inspection process and clearing procedures resulted in 24% increase in government revenues.

Source: https://www.gtreview.com/news/africa/paperless-port-system-prompts-import-revenue-growth-in-ghana/

Digitalisation of the transport sector and port infrastructure has the potential to add GHS 4.3 billion to transport value-add, equivalent to 4.8% of the sub-sector's value-add by 2029. This would result in 80,000 additional employment opportunities by 2029, and GHS 700 million in additional tax revenues from the increase in value addition to the economy.

Table 8: Potential impacts of digitalisation of Transport in Ghana (2029)

Digital value add (GHS million)	4,300
% of sector GDP	4.80%
% of Total GDP	0.30%
Employment	80,000
Tax revenue (GHS million)	700

Constant 2024 GHS. See Methodology Document that accompanies this report.

32 Government of Ghana, National Development Policy Framework 2022-2025.

Digital entrepreneurship and tech hubs

Digital entrepreneurship provides new opportunities for job and skills creation and is one the pillars of the Government's RESET agenda. The Government has launched its One Million Coders Programme, with the goal of providing one million young Ghanaians with digital skills training empowering them to thrive in growing BPO and KPO sectors.[33] MNOs are also partnering with government on digital skills and education programmes (Box 5).

Box 5: Mobile operator digital skills programmes

The MTN Skills Academy provides access to digital and financial skills training, including coding, web development, digital marketing and data analytics. In March 2025, MTN Group signed a Memorandum of Understanding with MCDTI to support the Government's One Million Coders Programme.[34]

The Telecel Digitech Academy equips young students across Ghana with essential digital skills and Science, Technology, Engineering, and Mathematics (STEM) education to prepare the next generation of Ghanaians for the evolving global economy. In the first cohort, 700 students from 38 schools across six regions successfully completed the training. Telecel's Connected Learning programme has introduced over 20,000 children to digital technologies, including AI, robotics, empowering future generations with the skills necessary to thrive in the AI-driven economy.[35]

Ghana has a well-established start up ecosystem, with over 145 innovation and tech hubs.[36] Successful start-ups and incubators in the country include the Impact Hub Accra[37] and Kumasi Hive,[38] as well as the pan-African incubator Mest.[39] These hubs benefit from a strong pool of tech talent leveraging their close network of local universities including public institutions like Kwame Nkrumah University of Science and Technology (KNUST) and the University of Ghana. This ecosystem has attracted almost USD 280 million in funding over the period 2019-2022.[40]

Start-ups have benefited from partnerships with MNOs in Ghana. For example, PEG, a pay-as-you-go (PAYG) financing company, started providing loans for solar home systems to off-grid households through a partnership with MTN Money and AirtelTigo Money. It was later acquired by Bboxx – a pan-African company providing access to energy and essential services to households, businesses and communities through data-powered logistics and innovative financing methods.[41] Mobile operators are also providing products and services, focussed on digitalisation of MSMEs (Box 6).

33 National Broadcast on the occasion of the first 120 days in office by H.E. President Mahama, 7 May 2025.
34 MTN Group press release "MTN and Ghana agree to work together to extend AI, coding and digital skills", 5 March 2025.
35 Telecel Group press release "Telecel Ghana Foundation introduces "Telecel Digitech Academy" to equip students With future-ready skills", 23 October 2024; Telecel Group press release "Telecel CEO speaks on AI & Sustainability at World Economic Forum", 6 February 2025.
36 Ghana Tech Lab.
37 https://accra.impacthub.net/about-us/.
38 Kumasihive.com.
39 https://meltwater.org/.
40 Thebigdeal.substack.com.
41 https://cleantechnica.com/2022/09/09/bboxx-acquires-peg-africa/.

Box 6: Mobile operator SME programmes

MTN's SME in a Box bundle (which offers mobile data, fixed data and Office 365) and SME Accelerate training programme (in partnership with Ghana Commercial Bank and the Small and Medium-sized Enterprises Ghana Awards) support the digitalisation of SMEs. MTN's Adwumapa Bundle is a package designed specifically for women-led SMEs, which aims to facilitate network connections and provide exclusive access to market opportunities for women in the SME sector.[42]

Telecel's One Business provides broadband, fixed and mobile voice, and a professionally designed one-page website, and partners on SME development programmes such as the annual SME month, with the 2024 theme focussing on "Connecting the Woman in Business".[43]

Impact of digital Government in Ghana

Ghana is one of the leading African countries in e-government. The country commenced the USD 212 million e-transform programme in 2013, supported by the World Bank's Digital Economy for Africa (DE4A) initiative.[44] Digital Government continues to be a key pillar in the Ghana Government's RESET agenda.[45] This continues recent government digital policies and programmes, including the Ghana Integrated Digital Transformation Blueprint 2021- 2027 and 2022-27 Ghana Digital Acceleration Plan (GDAP).[46]

This digital government progress is well recognised internationally. With an overall index score of 0.63 on the UN E-Government Development Index (EGDI) 2024, Ghana is ranked as having High EGDI. It is seventh highest in Africa, well above the average for the African continent and the highest ranked country in West Africa.[47] Examples of some of the digital government programmes in Ghana that are currently underway are provided in Table 9.

Table 9: Digital government programmes in Ghana

Programme	Summary
Internet connectivity	• Providing greater internet bandwidth in government offices, health centres, hospitals, schools, and universities in more than 250 districts, including underserved parts of the country.[48] • GIFEC has been tasked with connecting 3,500 centres to digital government services across the country.[49]
Online portal	• The Ghana.gov online portal provides access to and payment for services of over 1,295 government agencies including: birth, death and marriage certificates, business registration and permits, online passport applications, vehicle registration and drivers' licenses. • In 2022, over 10 million transactions were recorded with total payments receipts of GHS 62.76 billion. • The Ghana Digital Acceleration Project 2022-2027 set targets to increase usage of the Ghana.Gov portal through new or re-engineered user friendly and citizen-centric public service delivery, with a target of 85% user satisfaction.[50] The same project also provided digital skills training for 10,000 government employees.[51]

42 MTN Group Integrated Report 2024; Business & Financial Times online article "MTN, GCB, SMEGA partner to accelerate SME growth", 14 May 2025; MTN interview for this report.
43 Telecel Ghana business services, company website; Business & Financial Times Online article "7th SME Month launched by Telecel", 6 September 2024.
44 The right mix of training, mentoring, and online technologies can provide inclusive access to digital technologies in Ghana (worldbank.org), article published 17 November 2021; Pg 30, World Bank- Ghana Country Partnership Framework 2022-2027, 24 January 2022
45 Quarter 1 2025 Media Briefing: Ministry of Communication, Digital Technology and Innovations, April 2025.
46 World Bank Implementation Status and Results Report 2023 (P176126) – Ghana Digital Acceleration Project World Bank Document
47 UN E-Government Digital Index 2024.
48 World Bank, The right mix of training, mentoring, and online technologies can provide inclusive access to digital technologies in Ghana, 17 November 2021.
49 Ministry of Communication, Digital Technology, and Innovations, Quarter 1 2025 Media Briefing, April 2025.
50 GSMA, GSMA Inclusive E-Government Services in Ghana, July 2023, p14-23.
51 World Bank, World Bank-Ghana Country Partnership Framework 2022-2027, 24 January 2022; World Bank.

Ghana Revenue Authority	• Digitalisation and data analytics is a key pillar of the Ghana Revenue Authority's (GRA) "360 by 28" strategy that was recently announced to achieve tax targets.[52]
Digital Identity	• Ghana Card – digital biometric national ID card, which is used for taxpayer identification, social security purposes, and financial transactions. To date, half the adult population is registered.
Health Insurance	• My National Health Insurance Scheme (NHIS) App and Mobile Short Codes provides for membership renewal, with associated payments from mobile money and bank cards, and submission of claims. MNOs partner with NHIS, for example Telecel Ghana Foundation "Healthfest" initative undertakes registrations and renewals.[53] • Whilst the take up of the app is still low with initial NHIS membership registration done in person, positive trends include 80% membership renewals are through Mobile Short Code resulting in a 50% increase of membership and 70% of claims are made electronically.[54]
Social welfare distribution – LEAP	• Livelihood Empowerment Against Poverty (LEAP) social protection programme adopted transfer payments via mobile money in response to the effects of COVID-19 in 2020-2022. • This cost efficient and timely approach for payments, relied on Short Messaging Service (SMS) and interactive voice messaging in three local languages to communicate with beneficiaries before and after the transaction. The scheme also alerted recipients when to expect transfers, communicated the amount credited to their mobile money account, and provided information about mobile money fraud and scams. • 78% of beneficiaries who responded to a post-payment monitoring survey confirmed that they did not have to bear any extra cost to receive the funds, compared to cost and time incurred to travel to a bank or other payment points.[55] • E-zwich, the interoperable biometric smartcard, is used to pay cash transfers to beneficiaries of LEAP. In 2022, GHS 14.6 billion was transferred in 6.1 million transactions.[56]

Ghana has learned from its e-government experience, informing the design of the GDAP 2021 – 2027 and other government digital strategy initiatives. The GDAP includes components to support enabling regulatory reforms and build digital regulatory capacity, strengthen cyber-security and data protection, deepen digital skills training programmes, user-centric design services and processes, and support program management and governance. The sub-component of enhancing user centric services was allocated USD 64.5 million. This GDAP programme is summarised in Table 10.

52 Ghanaweb article GRA targets GH¢360 billion in tax revenue by 2028 to boost domestic mobilisation, 7 May 2025.
53 Telecel Ghana Foundation "healthfest" article, company website.
54 GSMA, Inclusive E-Government Services in Ghana, July 2023, p24.
55 GSMA, Inclusive E-Government Services in Ghana, July 2023, p25.
56 GSMA, Inclusive E-Government Services in Ghana, July 2023, p33.

Table 10: Ghana Digital Acceleration Plan: Digital Government component

Component 2: Modernizing Digital Government Services (by establishing agile and citizen-centric digital government model)
Sub-component 2.1: Change management moving towards a strengthened digital governance • Conducting assessment to evaluate current institution arrangements and review international best practices that could enhance current national digital governance. • Develop sound governance framework for general political coordination for development of digital government led by MoDC, and operational coordination led by NITA. • Institutional strengthening activities for MoCD, NITA and other agencies to fulfil digital government mandates, including purchase of equipment, analytics tools, and specific technical support.
Sub-component 2.2: Digital government - enhancing user centric services (USD 64.5m) • Increased access to user-friendly, integrated, end to end digital public services focussed on Ghana.gov portal and apps. • Accelerate digital adoption within public sector, streamline government processes, simplify e-services, and diversify channels for end-users to stimulate service uptake. • Improve human-centric design for digital public services.
Sub-component 2.3: Future of work in government (USD 6m) • Support design of a skills for digital public sector strategy, including IT officials competency framework and specific training programme. • Assess and measure supply and demand of digital skills • Capacity building and training strategy for civil servants to advance digital government transformation. • Expanding smart workplace virtual working solution for government and civil service Support providing selected agencies with ICT equipment and data analytics tools.

Countries with advanced digital government services are reaping benefits, especially when integrated with digital payments. This has been documented from research and analysis of the effects of digital transformation in the public sector. For example, studies have found that digitalising government payments could save approximately 0.8–1.1% of GDP.[57] Similarly, it has been shown that countries that have adopted digital Payment-2-Government (P2G) services experience a 1.2 to 1.3 percentage point boost in direct tax revenue as a share of GDP.[58]

Successful implementation of the GDAP and the Government's RESET agenda digital initiatives will have a significant impact on the economy. This report outlines policy recommendations for consideration as part of the regulatory reform activities being undertaken under this programme.

Improvement of e-government in Ghana has the potential to add GHS 5.8 billion in additional tax revenues, equivalent to 2.3% of total tax revenue by 2029.

Table 11: Potential impacts of digital government on tax revenue in Ghana (2029)

Digital value add (GHS million)	5,800
% of sector GDP	2.30%
% of Total GDP	0.40%

Constant 2024 GHS. See Methodology Document that accompanies this report.

57 Susan Lund, Olivia White, and Jason Lamb, The Value of Digitalizing Government Payments in Developing Economies, in Digital Revolutions in Public Finance, 2017, IMF.

58 Abdoul-Akim Wandaogo, Fayçal Sawadogo and Jesse Lastunen, Does the adoption of peer-to-government mobile payments improve tax revenue mobilization in developing countries?, UNU-WIDER Working Paper 2022/18, February 2022.



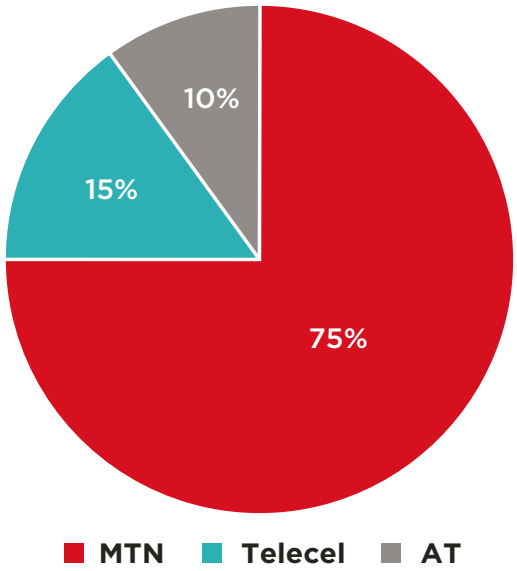
4. The Telecommunications Sector in Ghana

A. SECTOR OVERVIEW

Market structure

Ghana has three full-service MNOs which offer a range of mobile voice, data and mobile financial services. MTN Ghana is the largest operator with a 75% market share by registered subscribers. Telecel Ghana (formerly Vodafone Ghana) and AT (formerly AirtelTigo) are the other major players, with 15% and 10% market shares respectively (Figure 13).

Figure 13: Market Shares by Registered SIMs, July 2024



Source: NCA[59]

The mobile industry combines both local and international ownership, with a significant participation by the state. MTN Ghana is controlled by MTN Group of South Africa. Telecel is owned by Telecel Group and the Ghanaian Government while AT is fully owned by the Ghanaian Government.

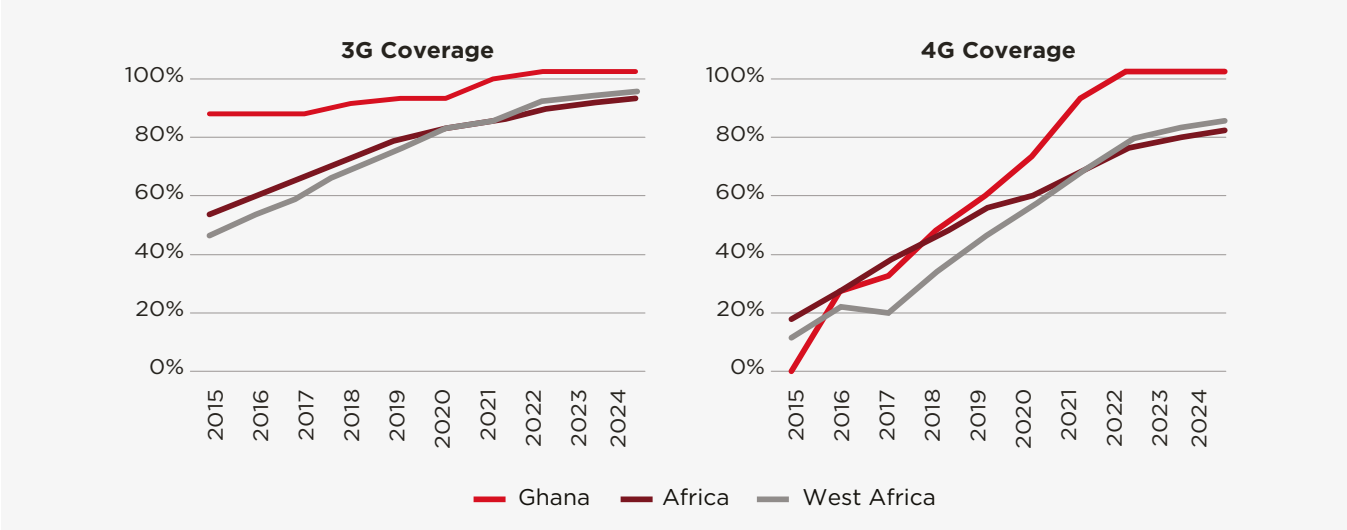
Market outcomes

Ghana has excellent coverage and is the best performer for 4G coverage in West Africa. Ghana's population coverage is at more than 99% for both 3G and 4G networks, making it a leader in Africa and the best performer in West Africa (Figure 14).

However, national coverage is heavily driven by MTN, with smaller operators with much lower levels. The GSMA estimates that Telecel's 4G coverage is below 40% of the population, while AT has not yet rolled out 4G.[60]

59 National Communications Authority, Shaping the Future. December 2024.
60 GSMA Intelligence.

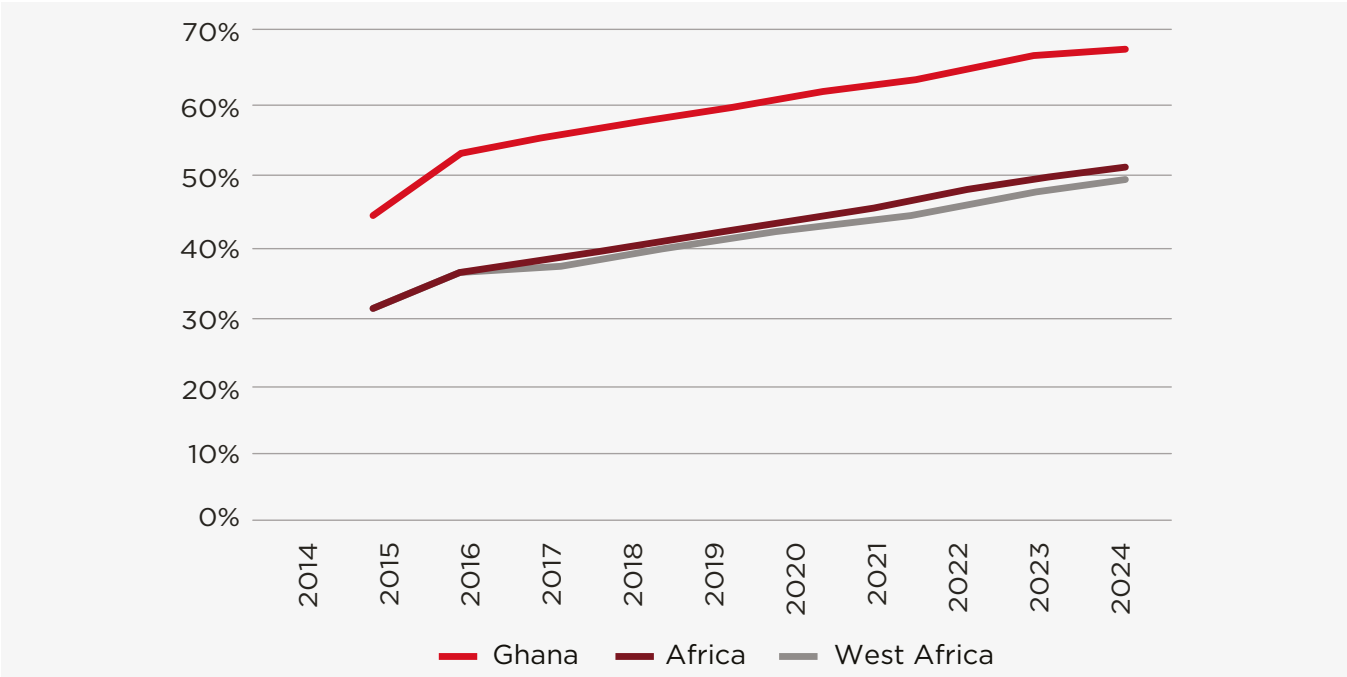
Figure 14: Network Coverage by technology



Source: GSMA Intelligence.

From GSMA's analysis of the number of unique mobile subscribers across the region. This is lower than the number of active SIM cards because many customers have multiple SIM cards. Estimating the number of unique users is important for policy because it is a measure of how many people have access to mobile services. However, it is difficult to estimate from MNO subscriber data alone. GSMA uses a range of different techniques, including surveys and modelling, to estimate the number of unique mobile users using a consistent methodology that allows cross-country comparison. It estimates that approximately 21 million people in Ghana use mobile services, equivalent to about 60% of the total population and 95% of the adult population.[61] This puts Ghana well above the regional and Africa's average for the percentage of population using mobile services (Figure 15).

Figure 15: Unique mobile subscriber penetration

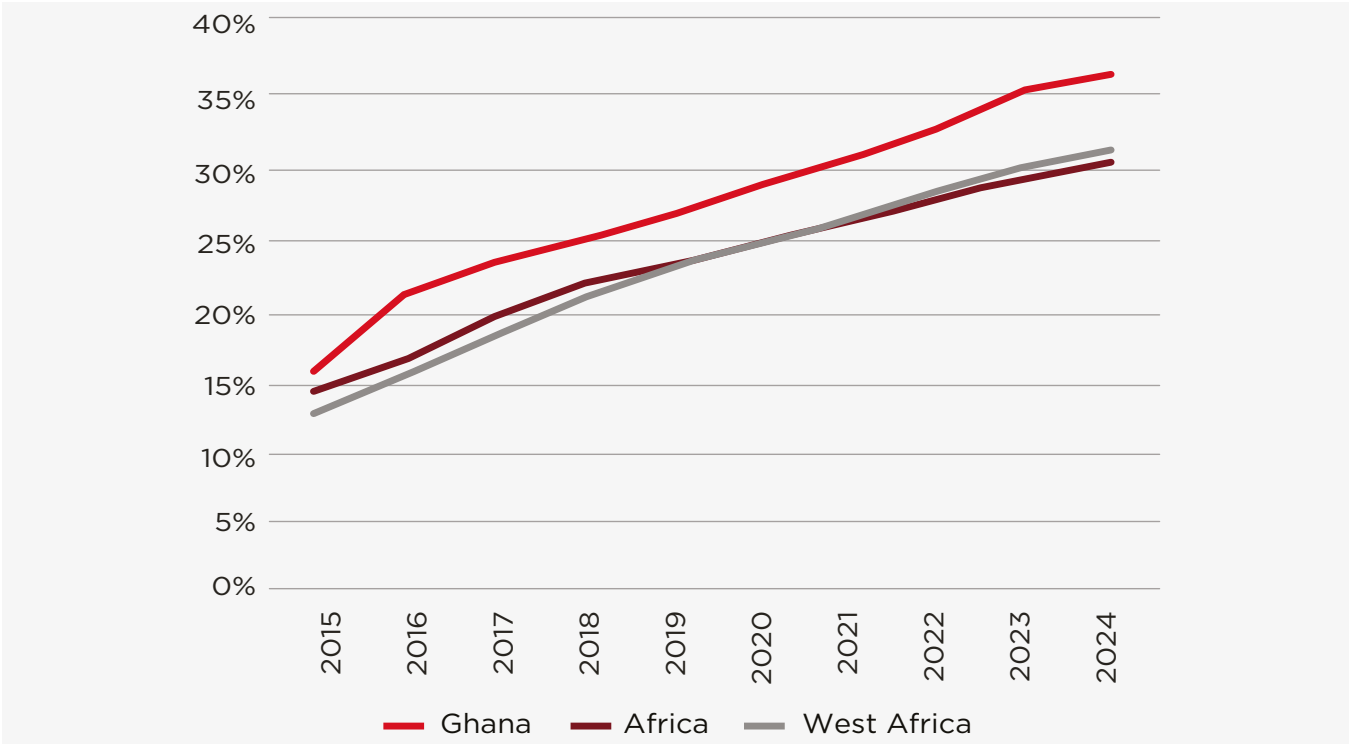


Source: GSMA Intelligence.

61 GSMA Intelligence, UN WorldPop. Adult Population is based on the population aged 14 and over.

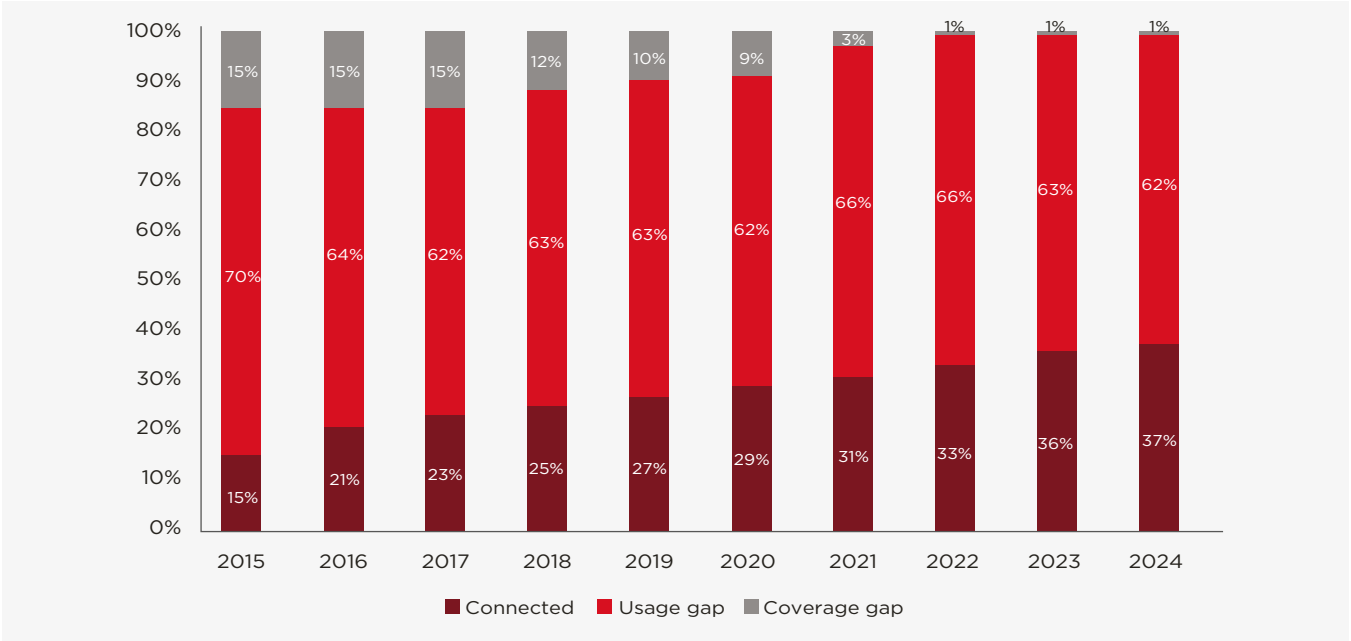
Despite the high levels of 3G and 4G coverage, uptake of mobile internet still has a lot of room for growth with 37% of Ghana's population using mobile internet,[62] above the average for Africa and West Africa (Figure 16). However, with near total coverage, this still translates into a usage gap of 62% (Figure 17).

Figure 16: Mobile internet's unique subscribers



Source: GSMA Intelligence.

Figure 17: Mobile internet usage gap

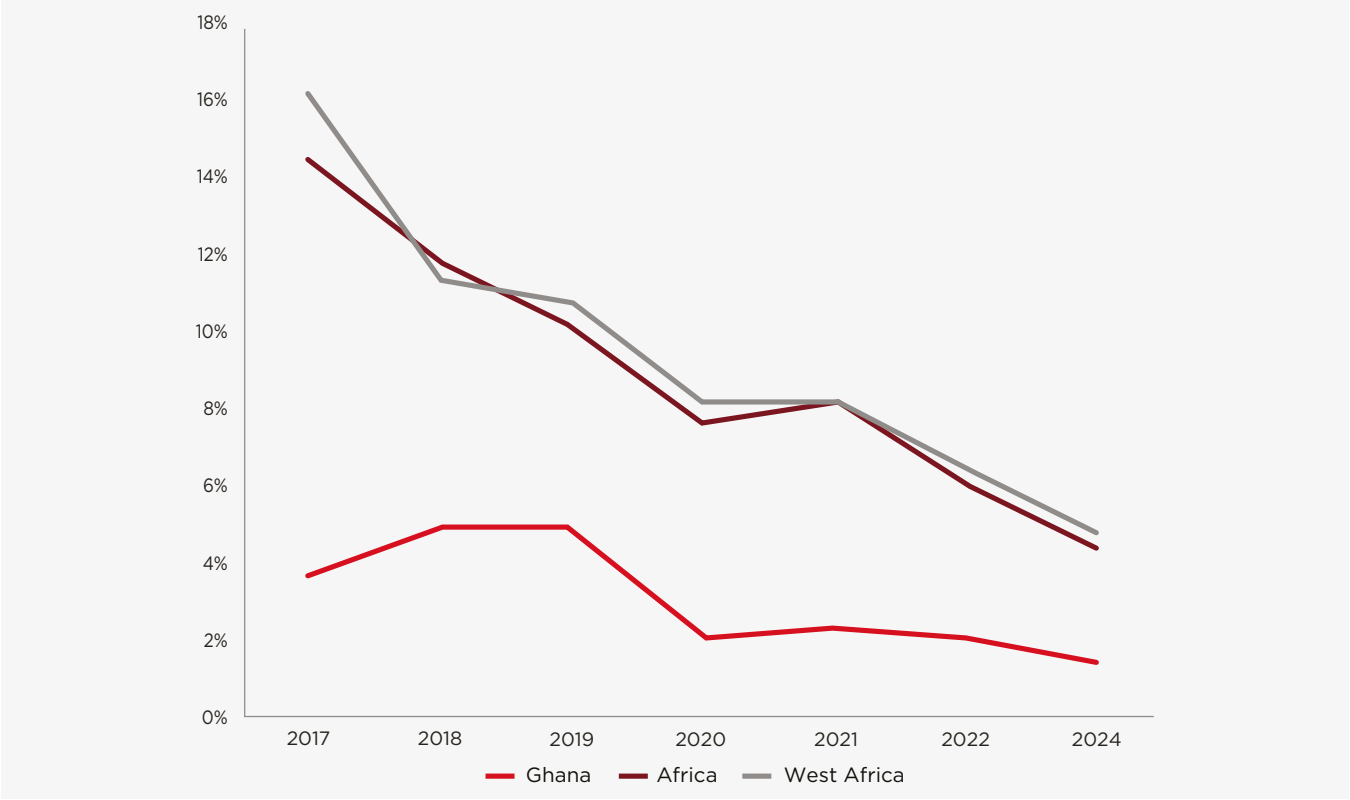


Source: GSMA Intelligence.

62 Defined as "unique mobile internet subscriber", i.e. excluding any dual SIMs.

Ghana has some of the most affordable data baskets in Africa. According to the ITU, the cost of data in Ghana (as a percentage of GNI per capita) for a basic data-only package is well below the African and West African averages (Figure 18). At 1.5% of GNI per capita, the cost of a basic data package in Ghana is cheaper than in other countries in the region such as South Africa and Nigeria (at 1.6% and 1.8% respectively), and well below the average cost across Africa of 4.5%.[63] The recent announcement by the Minister for Communication, Digital Technology and Innovation on the state of data prices includes new changes to provide affordable data bundles from MNOs, effective 1 July 2025.[64]

Figure 18: Comparison of basic data cost



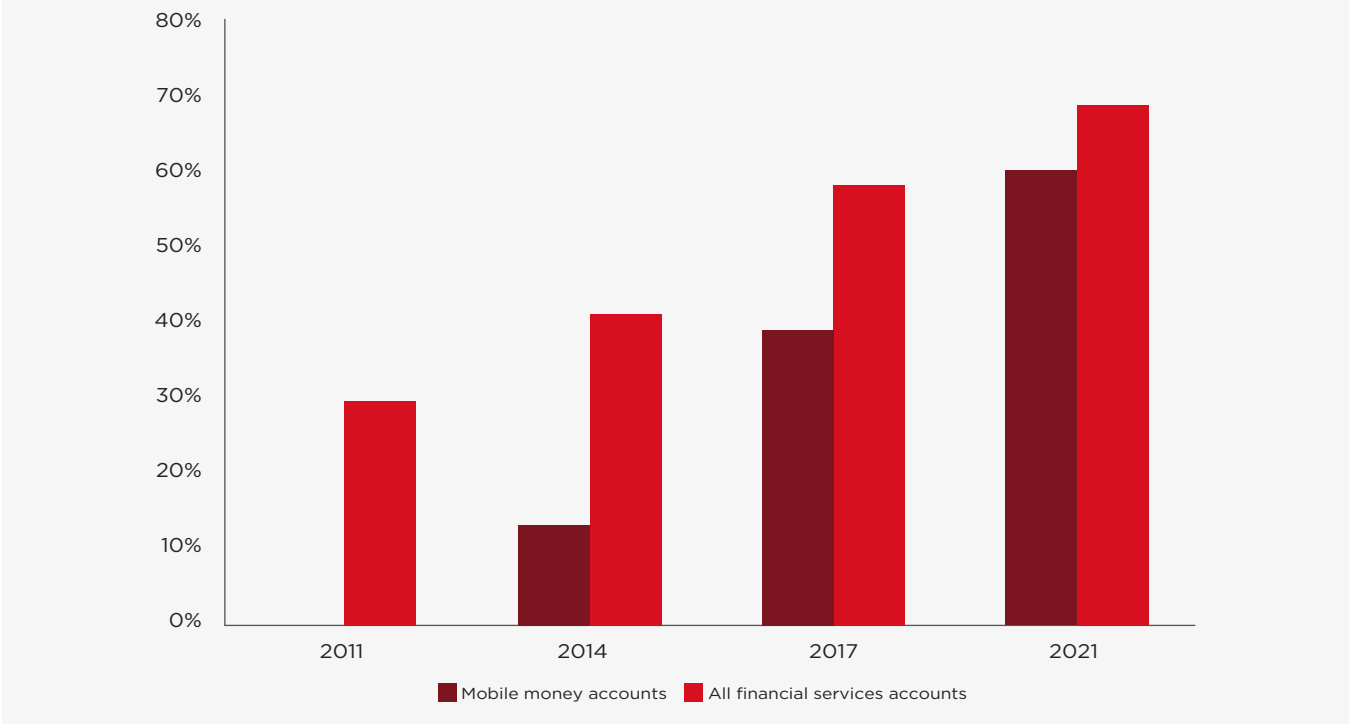
Source: ITU.

Average download speeds are moderate, below those reported in some West African countries. The average speeds reported to Ookla by mobile internet users in Ghana in May 2024 were 16 Mbps, below those reported in Nigeria (22Mbps) or Cote D'Ivoire (23Mbps) in the same month.[65]

The level of financial inclusion in Ghana has grown rapidly since 2011, largely driven by the growth of mobile money. The percentage of the population with a financial services account rose from 29% in 2011 to 68% in 2021, making it the fifth highest in Africa after Mauritius, South Africa, Kenya and Namibia.[66, 67] The population with accounts in financial services institutions increased by just 10 percentage points in this period, while the population with mobile money accounts increased from 0% to 60% in the same period. Figure 19 shows the growth of all financial services accounts and the growth in mobile money accounts between 2011 and 2021.

63 ITU.
64 Press statement by the Minister of Communication, Digital Technology and Innovation on the current state of data prices in the country, 10 June 2025.
65 Ookla Speedtest Global Index, May 2024.
66 In this analysis, only the population who are aged 15+ are included.
67 Findex data, ranking from 2021.

Figure 19: Proportion of population with a financial services account



Source: World Bank Global Financial Inclusion Database, 2021

Note: Only considers population who are 15+. "All Financial services accounts" include both accounts at formal financial institutions and mobile money accounts.

B. POLICY CHALLENGES

Ghana is recognised as having a solid sectoral policy and regulatory framework, although some areas for improvement have been identified. The ITU G5 Benchmark 2023 ranked Ghana as 6th in Africa and 68th (out of 193) globally, performing well on the pillar "national collaborative governance" with "policy design principles" identified as an area for improvement.[68] **The GSMA Digital Policy and Regulatory Index 2024 recognised Ghana's progress on consumer protection, data protection, and cybersecurity policy and regulation. However, the GSMA Index also identified licensing and spectrum, network regulation (notably quality of service), taxation, and public policy issues such as affordability and digital skills as key areas to address.** The GSMA ranks Ghana as first in its Mobile Money Regulatory Index 2024, for providing an enabling policy and regulatory environment for mobile money services and financial inclusion.

68 ITU, Benchmark of fifth-generation collaborative digital regulation 2023 – Global and regional trends, 2023.

Table 12: GSMA Digital Policy and Regulatory Index 2024[69]

GHANA (43/100)

Licensing and Spectrum			**Consumer Protection**		
Licensing Framework	🔴	0 /100	Consumer Protection Framework	🟡	75 /100
Spectrum Roadmap	🔴	0 /100	Data Protection Framework	🟢	100 /100
Spectrum Assignment	🔴	44 /100	Cybersecurity	🟢	87 /100
Mobile backhaul	🟡	67 /100	Cross-border data flow	🟢	100 /100
Technology neutrality	🔴	0 /100	SIM Registration	🟢	100 /100
Spectrum fees	🟢	100 /100			
License duration	🟡	50 /100			
Spectrum leasing and trading	🟡	50 /100			
Network Regulation			**Taxation**		
Harmonised deployment	🟢	100 /100	Consumer mobile taxes	🔴	40 /100
Small cell deployment	🔴	0 /100	Consumer handset taxes	🔴	0 /100
Fibre regulation	🟡	50 /100	Operator taxes	🔴	0 /100
Infrastructure sharing	🔴	40 /100	Fiscal incentives	🔴	0 /100
Coverage Obligations	🟡	50 /100	Tax stability	🔴	0 /100
Quality of Service	🔴	0 /100	**Public Policy**		
Commercial Flexibility	🟡	50 /100	Affordability and Digital Skills	🔴	0 /100
			Gender and rural inclusion	🔴	0 /100
			USF Management	🟡	50 /100
			Competition Policy	🟢	100 /100
			Start-up Regulation	🔴	0 /100

These findings are consistent with the key action areas and initiatives recently outlined by the Minister for Communication, Digital Technology, and Innovations. They also inform the policy challenges and recommendations described in this report.

The telecoms sector has made strong progress towards a more digital Ghana in recent years, and this trajectory is likely to continue. Coverage and availability of mobile services and mobile money have increased rapidly, and prices have fallen. Together, these trends have stimulated uptake and supported further inclusion in the digital economy. The current market structure and policy environment are likely to result in continued steady growth in uptake and usage of mobile services.

However, the necessary transformation for a digitally inclusive and data driven economy continues to require bold actions that will increase the affordability of digital services, expand reach, and enable and encourage use of the internet. In order to promote growth, several key policy challenges need to be addressed, particularly focused on reducing customers' cost of using mobile services and promoting investment into network expansion. By addressing these issues, the government could promote adoption and usage of mobile services for the benefit of all citizens. Further, wider adoption and usage of mobile services in the country will benefit both the government and citizens through higher productivity, better and more efficient public services, economic growth and social inclusion.

69 GSMA Intelligence, Digital Africa Policy and Regulatory Index results for Ghana, 2024.

Policy Challenge 1 – Improving affordability and inclusivity of ICT and digital services

A key challenge for Ghana lies in making the benefits of digital services accessible to the entire population, many of whom earn low incomes. One significant lever that can address this challenge is taxation.

Improving affordability through reduced taxation of digital services

Mobile consumers and operators are subject to a range of sector-specific taxes. These taxes raise the cost and decrease demand for mobile services. They also affect the investment case for operators wishing to expand their networks, both through increasing the direct cost of the investment and through reduced demand.

Table 13 (below) shows the total tax and other payments paid by the mobile sector to the government in 2023 as reported by the Ghana Chamber of Telecommunications. These totalled GHS 9.83 billion, which equated to 43.8% of total industry revenue.[70] Notably, the total tax rate on mobile use is about 24% of the cost (5% communications service tax, 19% combined VAT rate on use of mobile services and devices), which is amongst the highest in Sub-Saharan Africa.

Table 13: Mobile Sector Taxes in Ghana

Tax, levies and fees	Mobile industry tax contribution 2023 (GHS)
Corporate Income Tax	1.71 billion
Value Added Tax	1.42 billion
NHIL + GETF levy + Covid 19 levy	996.30 million
E-Levy	938.87 million
Withholding Tax	849.52 million
Communications Service Tax	636.83 million
Import Duties	609.68 million
PAYE	234.01 million
Other remittances	2.01 billion
Total tax and other payments to government	**9.83 billion**

Source: Ghana Chamber of Telecommunications Mobile Industry Transparency Initiative 2023

Taxation of the mobile industry increases costs to consumers. Although these taxes are levied on mobile operators, most of the costs are passed on to customers through higher prices. Previous studies have found that 90% of changes to the value of consumer taxes (e.g. sales and usage taxes such as the communications service tax) are passed through to consumers, while 85% of changes to the value of operator taxes (e.g. revenue and profit taxes, spectrum and license fees) are passed through to consumers.[71]

Excessive taxation can also reduce investment in network infrastructure and mobile services. Lower taxes on operators free up funds for investment in additional network infrastructure and services for greater mobile internet coverage or network upgrades to improve the speed and quality (e.g. upgrading from 3G to 4G or from 4G to 5G). Moreover, many of the sector-specific taxes are not applied on profits but are instead either fixed or charged as a percentage of revenues, irrespective of profitability. This is particularly regressive and can distort investment decisions.

70 Note that this includes the E-Levy that the new government has repealed from April 2025.
71 World Bank. Using Geospatial Analysis to Overhaul Connectivity Policies, 2022, Table A.2.

Impact of policy recommendations

Improving affordability by reducing the taxation of digital services would result in 630,000 additional mobile internet users by 2029. The table below shows outputs from modelling of the impact of a combination of mobile tax reductions on mobile internet uptake.[72] The tax reforms modelled include removal of the Communications Service Tax (CST) and import duties on handsets, together with a reduction in revenue-based taxes and fees on operators.

Table 14: Mobile internet users with sector-specific tax reduction

Mobile internet users (m)	2024	2025	2026	2027	2028	2029
Business-As-Usual (BAU)	13.15	13.90	14.68	15.51	16.37	17.28
Tax reduction	13.15	14.01	14.92	15.87	16.87	17.91
Year-on-Year difference to BAU	0%	1%	2%	2%	3%	4%
Increase in growth vs BAU	0%	+1%	+2%	+3%	+4%	+5%

The mobile money levy

Demand for mobile money arises when customers value the service and prices are affordable. The rapid growth in mobile money in Ghana, as elsewhere in Africa, clearly demonstrates demand for financial services in the region. People value the services as an alternative to cash because of ease of use, speed, flexibility and security. The lack of access to traditional financial services for many people further increases demand for mobile money.

Mobile money has been a key driver of financial inclusion in Ghana. As shown in Figure 19 above, growth in financial services accounts has been largely driven by mobile money, and the majority of financial accounts in Ghana are now mobile money accounts.

The Mobile Money Levy, introduced in Ghana in 2022, had a significant negative impact on both uptake and usage of mobile money. A 2023 GSMA paper found that the introduction of the levy had a strong negative impact on the value and volume of person-to-person ("P-2-P") transactions, a negative impact on mobile operator revenue, and a net negative effect on government tax revenue.[73] A similar impact was seen in other countries, such as Tanzania, where introduction of a levy resulted in a large decrease in usage of mobile money, compared to the pre-levy trends.[74] It is further estimated that the Ghanaian levy had a persistent negative impact on the number of mobile money users, with 5% fewer users at the end of 2023 as a result of the levy than if pre-levy uptake trends had continued.

The mobile money levy had an adverse impact on other government objectives. Mobile money is an important enabler of financial inclusion as well as a wide range of other benefits to citizens and to the government. Mobile money is one of the key services that enhance productivity in small and micro enterprises. Such businesses make and receive payments more efficiently and securely through mobile money than traditional forms of payment. It is also one of the core functions that enable e-government. For example, payment of pensions or social benefits using mobile money is much cheaper and more secure than via the traditional financial and cash system. By limiting access and adoption of mobile money, the levy is therefore constraining the country's ability to take advantage of these other benefits. At the same time, the levy raised significantly less revenue for the Government than initially forecasted, as consumers changed their behaviour.[75]

72 See the accompanying Methodology Document for the modelling assumptions.
73 GSMA, The E-levy in Ghana: Economic Impact Assessment, 2023.
74 GSMA, Tanzania Mobile Money Levy Impact Assessment, 2023.
75 Ghana Revenue Authority and Institute of Development Studies, Ghana's e-levy: 3 lessons from the abolished mobile money tax, April 2025.

The removal of the mobile money levy in April 2025 is therefore expected to have a significant positive impact. It is anticipated that there will be millions of additional mobile money users, as well as higher transaction volumes and values as a result of this removal. This will, in turn, generate higher economic activity and indirectly additional revenues for the Government.

Policy Challenge 2 – Increasing the reach and accessibility of digital services

Ghana has made significant progress in providing 2G, 3G and 4G mobile telecommunications network infrastructure. Expanding coverage of 4G and 5G networks among other digital infrastructure require continual investment. Operators, tower infrastructure companies, and other infrastructure providers make network investments. In parallel with this, the cost of operating the networks is a key driver of business performance and financial sustainability.

The sector faces a series of key policy challenges which need to be addressed to enable Ghana's further digital transformation.

Spectrum roadmap

The recent policy decisions on technology neutrality and spectrum assignments to MTN and Telecel are laudable. **However, continuing Ghana's progress on digital infrastructure as a foundation for digital transformation objectives, requires a long-term and future-proof spectrum management policy and roadmap.**

Box 7 summarises policy recommendations relating to 5G spectrum for consideration by the government and the NCA to boost investment in digital infrastructure and reduce the mobile broadband usage gap.

Box 7: GSMA 5G Spectrum policy recommendations[76]

1. Full-power, licensed spectrum is vital to the success of 5G.
2. 5G needs spectrum across low, mid- and high bands to deliver capacity in all areas and support the full range of use cases. All three ranges have important roles to play.
   a. Low-band spectrum (below 1 GHz) is needed to drive digital equality, provide capacity in wider and rural areas, and for deep indoor coverage.
   b. Increased low-band capacity creates greater equality between urban and rural broadband connectivity and supports addressing the digital divide.
   c. Mid-bands (1-7 GHz) provide city-wide 5G capacity. They play a core role in delivering enhanced mobile broadband and applications which impact how we manufacture goods, deliver education, and build smart cities. To date, mid-band spectrum has been the most used to launch 5G networks around the globe.
   d. High-bands or mmWave (above 24 GHz) deliver the fastest broadband speeds and lowest latencies. They deliver the highest performance for 5G but only cover shorter distances so are used for high-capacity hotspots.
3. 5G needs significant harmonised spectrum and clearing prime bands should be prioritised to meet market demand. Regulators should aim to:
   a. Award 100 MHz of contiguous mid-band spectrum per operator for 5G launch
   b. Increase low-band spectrum capacity by assigning all available bands (including 600 MHz)
   c. Make 2 GHz of mid-band spectrum available per market by 2030 (e.g. through 3.5 GHz and 6 GHz assignments)
   d. Consult with industry over the need for mmWave to cover busy hotspots, allowing for an initial assignment of 800 MHz per operator and potentially making 5 GHz available per market as demand grows.
4. High 5G spectrum prices should be avoided as this is linked to slower broadband speeds and lower coverage. Excessive reserve prices and poor auction design, high annual fees, or limited spectrum supply (including through set-asides) can all lead to high spectrum costs. Increased network investment can also be supported through coverage and QoS commitments in exchange for cash payments.
5. 5G spectrum licence commitments and conditions must be related to achievable targets, deducted from reserve prices, and used to benefit broadband connectivity. Arbitrary targets can create unnecessary high costs and impact network investments.
6. Spectrum policy measures should be adopted to encourage long-term investment in networks. Indefinite or long-term licences, with a presumption of renewal, should be used for spectrum assignment. Further certainty can be provided through a long-term, technology-neutral spectrum roadmap.
7. Spectrum for private and local networks can be made available through public mobile networks or through network slicing or sub-leasing of national licences. Setting spectrum aside for private networks in priority 5G bands could jeopardise the success of public 5G services and has no positive impact on enterprise digitalisation.
8. Voluntary spectrum sharing and sub-leasing between operators does not reduce the overall amount of spectrum required in any market. However, allowing spectrum sharing between operators may support efficient spectrum use, lower network costs and optimise connectivity.
9. Regulators should carefully consider 5G backhaul needs, including making additional bands available and supporting wider bandwidths in existing bands. Measures should also be taken to ensure mobile backhaul licences are affordable and designed effectively.
10. WRC harmonisation helps the evolution of mobile. Governments and regulators should adopt internationally harmonised bands in their national plans to support affordability through economies of scale. Further harmonisation of mobile spectrum at future WRCs should be sought.

Another spectrum-related policy issue for consideration of the government, the NCA, and the sector is the sunsetting of 2G and 3G networks. Table 15 below outlines GSMA recommendations of a market-led process for undertaking 2G and 3G network sunsetting programme.

76 5G Spectrum GSMA Public Policy Position June 2022.



Table 15: GSMA – 2G and 3G network sunsetting in Sub-Saharan Africa[77]

Reasons for 2G and 3G network sunsetting	• Refarming spectrum for 4G and 5G upgrades, and in the process increase the efficient use of spectrum resources to meet growing demand for mobile broadband and machine to machine (M2M) IoT services. • Optimises network operations, with potential opex savings from fewer network maintenance contracts with network vendors. • Improves energy efficiency in the network (legacy networks are less energy efficient on a per-gigabyte basis) amid rising energy costs. • Realises Capital Expenditure (CapEx) savings from retiring 2G and 3G networks, which are nearing end of life and require a CapEx refresh. • Rationalises device portfolios and simplify tariff structures. • Minimises risks associated with the slowing improvements and maintenance of legacy equipment, some of which is due to lose support within a few years.
Important considerations when setting sunsetting plan	• On average, it takes 2–4 years between sunset announcement and actual network switch-off. The transition from legacy networks needs to take place in an efficient manner that causes the least disruption. • Shutting down 2G and 3G legacy networks with many subscribers still connected to them risks exacerbating the digital divide. • Ensuring universal 4G/5G coverage is an important prerequisite for legacy network sunsets. Where there are restrictions or onerous conditions for spectrum assignment and refarming current spectrum resources, delays in expanding 4G and 5G coverage are inevitable. • Legacy networks, particularly 2G, were primarily designed for voice services and still account for most voice traffic in Africa. Progress in investment and adoption of IP voice communication VoLTE and 5G Voice Over New Radio over 4G and 5G networks is required. • Affordability of 4G and 5G devices is challenging. Many consumers still use a 3G smartphone or a feature phone. Average Revenue Per Unit (ARPU) in Africa averages just over USD 3, compared to a global average of USD 8. The median affordability of an entry-level internet device in Sub-Saharan Africa is 30% of monthly income (almost twice the global median). For the poorest 40%, this is almost 70% of monthly income. • Overall traffic is decreasing much faster on 3G than 2G networks, as 3G users are generally more likely to upgrade to 4G than 2G users. Spectrum used for 3G can be re-farmed for 5G, particularly in 2100 MHz band. • Non 4G and 5G M2M IoT services are predominantly based on 2G rather than 3G network and will require long-term support. • 2G devices have longer battery lives, which is necessary for rural areas with unreliable or limited electricity coverage.

77 GSMA, Technology Neutrality and Legacy Network Sunsets - The Evolution of Connectivity in Africa, 2023.

Recommendations	• Sunset decision should be guided by the overarching principles of inclusion and minimising service disruption for consumers and businesses. Stakeholder engagement is essential to ensure that different perspectives are taken into consideration, and (where necessary) mitigation plans are formulated to support vulnerable users and communities. • Enable refarming of spectrum, contiguous for operators to use it optimally when refarming from legacy networks to 4G and 5G services. • Create a conducive environment to support investment in 4G and 5G networks to enable transition from legacy networks. For example, the level of charges for spectrum use and associated red tape can discourage more efficient use of spectrum, reduce the funds available to invest in 4G and 5G services, and ultimately delay the delivery of benefits of those technologies for users. • Use policy levers to improve the outlook for key considerations around legacy network sunsets. For example, eliminating taxes on 4G and VoLTE-enabled devices to increase affordability of devices. • Develop a roadmap for essential network preparation requirements, including 4G coverage expansion, VoLTE deployment and roaming agreements. This should align with local market realities and serve as a guide for the timescale of the legacy network sunset. • Consider both push and pull incentives for service upgrades for the most reluctant customers. For example, legacy device trade-in offers and seamless 4G SIM swap arrangements. • Define and communicate plans to support users who may be affected by technology upgrades and legacy network sunsets.

Expanding access to digital services by making it easier to build network infrastructure

The digital sector requires continued large-scale investment into building and maintaining infrastructure, including 4G and 5G mobile sites and fibre-optic cables. This requires the completion of regulatory processes to obtain construction and rights of way approvals from local authorities and the conditions attached to those permits.

As part of digital infrastructure programmes, governments and regulators in Africa and around the world are seeking to make these regulations and administrative processes more efficient and effective. This is done by implementing harmonised planning, building, rights of way, customs and other administrative processes for telecommunications nationally and across all local administrations. This includes – in many cases - the use of centralised digital administrative approvals and payment platforms. Governments are also imposing lower or zero-rated rights of way fees to reduce the cost of infrastructure investment. Examples of such initiatives include:

- The government of India, as part of its Digital Public Infrastructure Strategy, passed reforms to introduce a national right of way policy and introduced a single rights of way platform in 2022 across all 36 States and central government ministries. This has contributed to increasing connectivity of villages from 50% in 2020 to 93% by March 2023.[78] Similar models are being considered as part of the G20 digital infrastructure program.
- Right of Way fees have been lowered in countries, such as Nigeria and Tanzania.[79]

In Ghana, it is recommended that the Government and NCA consult on the developing and implementing a priority national infrastructure policy and regulatory framework. This would include the applicable regulations for telecommunications and introduction of a single digital administrative, coordination, and approvals platform to address these infrastructure deployment and maintenance challenges.

78 www.gatishaktisanchar.gov.in.

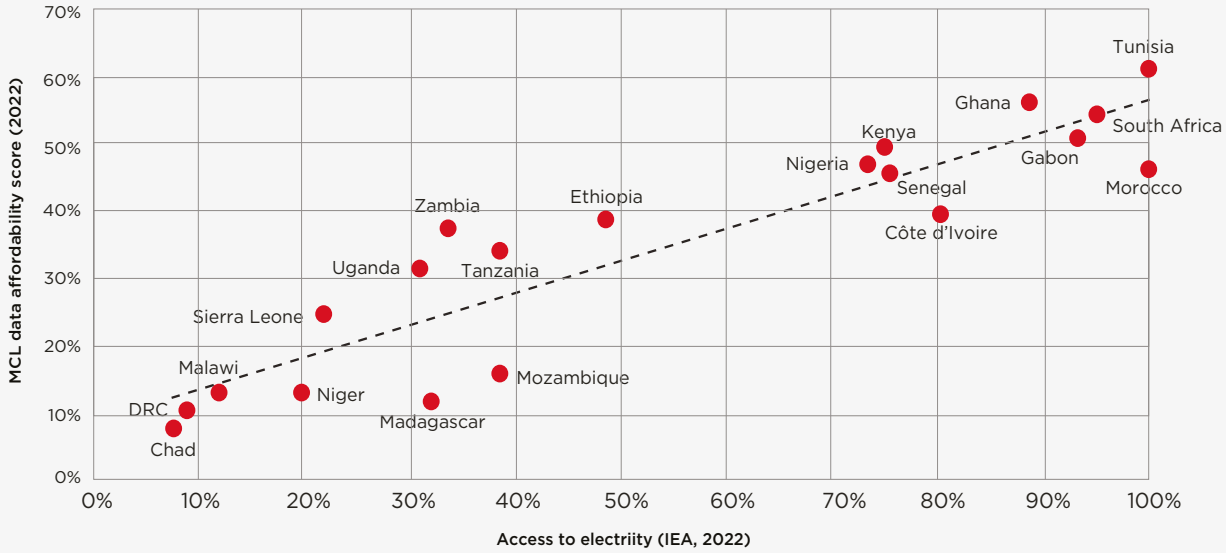
79 Research for GSMA Digital Economy Reports for Nigeria (2024) and Tanzania (2025).

Energy supply

Digital infrastructure is dependent on electric power supply. Meeting telecoms network coverage and quality of service obligations, especially in remote rural areas, is made more challenging by inconsistent power supply and rising costs of connecting to the national electricity grid and alternative energy sources such as diesel generators.

GSMA research has found that higher energy costs result in higher mobile prices. Conversely, where operators face lower costs as a result of access to the national grid energy, the affordability of services improves (Figure 20).

Figure 20: Relationship between energy costs and data affordability in selected African countries



Source: GSMA

At the same time, mobile operators are undertaking programmes to obtain energy supply from renewable energy sources. Box 8 below summarises some examples of such projects.

Box 8: Examples of mobile operators' renewable energy programmes

MTN	MTN is implementing the MTN Group Project Zero and Energy Program, tailored to energy supply conditions of the country, including energy management tooling, hybrid energy solutions and more efficient technology options. This includes 50% reduction of absolute Scope 1 and 2 Greenhouse gas (GHG) emissions by 2030, from a 2021 base year. In 2024, MTN Group achieved a 46.2% reduction with strong performance in South Africa and Ghana.[80]
Telecel	Telecel is solarising sites to reduce reliance on fossil fuels, besides launching a green hydrogen project in Ghana, a pioneering initiative in the region.[81]

The mobile sector is committed to partnering with the government and regulator(s) on these initiatives, and propose the following recommendations to provide energy supply for digital infrastructure and the broader digital economy:

- Designate telecoms as priority national infrastructure status to improve energy supply to mobile operators and tower companies;
- Implement a diesel rebate tax relief incentive for mobile operators and tower companies;
- Provide flexibility on the regulatory burden for licensees, particularly for NCA regulations (coverage, quality of service), whose compliance depends on a consistent power supply for optimal network connectivity; and
- Provide incentives for alternative energy supply/renewable energy sources used by the sector.

80 MTN Group Sustainability Report 2024.

81 Telecel Group, Telecel Group pledges to operate in the greenest way possible, 13 September 2024.

Vandalism, theft and damage of infrastructure

Common cases of theft and vandalism of telecoms network infrastructure are raising costs and affecting network performance. Mobile operators face persistent challenges with theft of equipment, particularly fuel, cables, batteries, and fibre optic junction boxes. This requires them to invest in additional security such surveillance systems, security personnel, and tamper-proof equipment. They also incur the cost of replacing affected infrastructure. These expenses represent a significant portion of operational budgets that could otherwise be directed toward network expansion or quality improvements. The current level of enforcement of the law to deter infrastructure theft and vandalism is not effective, particularly when set against the country's requirements for telecommunications and mobile financial services infrastructure (Box 9).

Box 9: The impact of theft and vandalism of telecoms network infrastructure[82]

In 2024, the Telecoms Chamber reported that there were over 5,600 fibre optic cable cuts, costing the telecoms sector GHS 138 million. The main causes of fibre cuts include:

- Road construction (20.68% of cases);
- Theft and vandalism (13.98%), often due to mistaken beliefs that fibre cables contain copper; and
- Private developers, broken ports, drain construction, fires, and flooding.

It is recommended that the government consider the following:

- Telecommunications is designated as priority national infrastructure status in applicable legislation and regulations, similar to other countries such as Nigeria's Critical National Information Infrastructure Order of 2024.
- Penalties for vandalism and theft by organised crime and individuals to be increased to provide harder sanctions and serve as a deterrent.
- Government, regulators, police, road, and security authorities work together with mobile operators to coordinate activities to protect infrastructure security, including stricter enforcement of excavation permits, mandatory relocation of telecom cables in new road projects, and collaboration with law enforcement.

Quality of Service review

The industry has welcomed MCDTI's recent policy decision to assign additional spectrum as one of the ways to improve quality of service. However, other issues that also impact the quality of service should be assessed when determining compliance. **It is recommended that the NCA should, as part of the review of the regulatory framework, consult on an action plan to review quality of service obligations and to address the underlying barriers to improvement.** This includes working to resolve issues outlined in this report under Policy Challenge 2, to enable investment and operations to provide digital infrastructure at the required quality of service.

USF reform

The MCDTI is considering reforms to GIFEC and commencing legislation to create a new Digital Economy and Innovation Development Fund. It is recommended that the MCDTI takes this opportunity to review progress made to date by GIFEC and develop a universal service strategy for the new Fund for digital infrastructure (including fibre backbone and 4G) and services in underserved areas in consultation with the sector.

82 Ghana News Agency. Ghana's telecom sector suffers over 5600 fibre cuts in 2024, 6 May 2025.

The GSMA and African Telecommunications Union recommendations on USFs are summarised below in Box 10.

Box 10: GSMA & ATU Universal Service Fund Policy recommendations[83]

1. Adopt mechanisms to incentivise disbursement of funds – establish clear targets and use incentives to ensure effective and timely disbursement.
2. Implement an evidence-based USF fee contribution rate – an evidence-based approach, in consultation with service providers, should be used to decide a suitable contribution rate.
3. Set clear and measurable targets for the USF – clearly define the parameters for USF projects and outline key success measures following implementation.
4. Continuous stakeholder consultation on USF policy and programmes, including local communities on the benefits of connectivity and to address any perceived concerns about digital infrastructure.
5. Use a data-led approach to select USF projects, ensure regular performance monitoring and reporting to provide visibility and accountability.
6. Establish a project costing system that accounts for overheads – a comprehensive costing system should account for overheads and OpEx from the outset, with a sustainable solution that guarantees the long-term viability of a USF project.
7. Explore alternative funding mechanisms – 'pay or play' model to incentivise investments in coverage expansion.
8. Build capacity and develop skills within the USF.
9. Consider an independent governance structure and seek to minimise or eliminate red tape and political interference in the management of funds and the implementation of USF projects.

Impact of policy recommendations

A more sustainable investment environment for the mobile industry could result in at least 490,000 additional mobile internet users in 2029. The table below shows outputs from modelling of the impact of the increased investment on mobile internet uptake.[84]

Table 16: Mobile internet uptake with sustainable investment

Mobile internet users (m)	2024	2025	2026	2027	2028	2029
BAU	13.15	13.90	14.68	15.51	16.37	17.28
Increased investment	13.15	13.94	14.79	15.71	16.71	17.77
Y-on-Y difference to BAU	0%	0%	1%	1%	2%	3%
Increase in growth vs BAU	0%	+0%	+1%	+2%	+3%	+4%

Policy Challenge 3 – Expanding the use of the internet by Ghana citizens

Affordability of devices is one of the greatest barriers to the digital economy and inclusion. Others include literacy and digital skills, and safety and security concerns.

Device affordability

GSMA research from 2024 found that:

- The entry-level smartphone device price in Ghana was USD 50;
- This equates to 27% of monthly GDP per capita and 76% of monthly GDP per capita for the poorest 40% of the population; and
- Taxation accounts for 30% of smartphone device costs - amongst the highest in Sub-Saharan Africa.

83 GSMA and ATU. Universal service funds in Africa Policy reforms to enhance effectiveness, October 2023.
84 See the accompanying methodology document for the modelling assumptions.

Addressing device affordability should be among key priorities for the new Digital Transformation Strategy. The government should consider the following policy measures:

- Reducing handset costs through removing sector-specific taxes and fees (see recommendation on taxation).
- Increasing access to financing by enabling innovative financing mechanisms for handsets, carefully considering remote locking for handsets while protecting consumers, engaging public-private partnerships to de-risk handset financing, and partnering with the industry to provide device subsidies for targeted user groups.
- Including ways to address willingness to pay, such as awareness campaigns on both the benefits and potential risks of using mobile internet and how to address them, and digital skills strategies that promote the value of handsets.
- Implementing effective strategies to tackle handset theft and the trading of counterfeit devices.[85]

The MNOs in Ghana are also undertaking initiatives to address device affordability (Box 11).

Box 11: Mobile operators' initiatives on device affordability

MTN has launched the Design-to-Cost programme in collaboration with ecosystem partners. This initiative focuses specifically on reducing the cost of entry-level 4G smartphones to 20% below existing market prices for affordable, fully-fledged 4G smartphones. In addition, through MTN's partnerships with device-financing providers, MTN is limiting the financial burden of paying for smartphones upfront. These device-financing programmes allow customers to pay a deposit of 20% to 30% of the smartphone's cost and settle the balance in instalments over several months (either six, nine or 12 months). In Ghana, MTN provides a "pick and pay later" programme with device financing through MTN MoMo.[86]

Telecel provides a device microfinance scheme to allow customers to pay for devices over a 4-month period.[87]

Digital literacy and skills

The Government's RESET agenda is prioritising digital skills and training, such as the One Million Coders programme. The importance of advancing digital literacy and skills is widely accepted as critical for digital and economic development. GSMA research has found that underserved population groups (such as women, rural communities, older people, and persons with disabilities) are more likely to report literacy and digital skills as barriers to mobile internet adoption and use. Ghana is among African countries leading the way in making government and public services available digitally. As described in more detail in this report, digital government can drive demand by citizens to develop digital skills and use the internet and mobile broadband services.

A recent GSMA report provides policy recommendations, which may assist the government and participating authorities in developing digital skills programmes as part of the new digital transformation and emerging technology strategy (Box 12).

85 GSMA, Digital Inclusion Policy Brief - Improving handset affordability in low- and middle-income countries, 2024.
86 MTN Group Sustainability Report 2024; MTN Ghana "pick and pay later" information, company website.
87 Telecel Ghana "device microfinance" information, company website.

Box 12: GSMA's policy recommendations on digital skills programmes[88]

- Use a comprehensive approach to design digital skills strategies focused on people's goals and needs, and to address barriers to acquisition.
- Run campaigns to increase awareness of mobile internet and digital skills training opportunities.
- Consider and invest in different channels that can be used to effectively deliver digital skills training and capacity building initiatives.
- Incorporate digital skills development in education policies at all levels and promote lifelong learning.
- Ensure digital skills programmes are inclusive and address the needs of the underserved.

Safety and security

The GSMA Digital Policy and Regulatory Index ranks Ghana highly in terms of its policy and regulatory framework on safety and security. Sustaining this will be critical to Ghana's continued digital transformation, including mobile telecoms and mobile money services. **Ghana needs to continue participating in international and regional Cybersecurity and data protection frameworks.** This includes the African Union Convention on Cybersecurity and Personal Data Protection (the Malabo Convention) which criminalises a broad range of cyber activities, including hacking, cyber fraud, and identity theft. It also establishes procedures for investigating and prosecuting cybercrime, including international cooperation between African countries.

Impact of policy recommendations

It is estimated that implementing policies to increase demand could result in at least 2.2 million additional mobile internet users in 2029. The table below shows outputs from modelling of the impact of a demand stimulation on mobile internet uptake.[89]

Table 17: Mobile internet uptake with demand stimulation

Mobile internet users (m)	2024	2025	2026	2027	2028	2029
BAU	13.15	13.90	14.68	15.51	16.37	17.28
Demand stimulation	13.15	14.25	15.43	16.69	18.03	19.47
Y-on-Y difference to BAU	0%	3%	5%	8%	10%	13%
Increase in growth vs BAU	0%	+3%	+6%	+9%	+13%	+17%

Policy Challenge 4 - Encouraging digital transformation

The rapid evolution of technology means that regulation of the sector needs to be regularly assessed to ensure that it reflects current market realities. Many other countries are moving forward on this, adapting their regulatory frameworks to reflect the way the market is changing as a way of supporting the digital economy. The Government's RESET agenda, together with the actions and initiatives outlined by MCDTI, recognise this. Of particular importance are the review of the legislative and regulatory framework, development of a new National Digital Transformation and Emerging Technologies Strategy, and development of a new National Artificial Intelligence Strategy.[90]

88 GSMA. 2024. Digital Inclusion Policy Brief - Advancing digital skills for greater digital inclusion in low- and middle-income countries.
89 See the accompanying Methodology Document for assumptions.
90 Quarter 1 Media Briefing: Ministry of Communication, Digital Technology and Innovations, April 2025.

Key issues to be addressed in the review of the regulatory framework and the new strategies include:

1. **Licensing, spectrum and regulatory framework which provides certainty to existing licensees to enable continued investment and innovation to achieve digitalisation objectives**

When considering changes to license regimes as part of review of the regulatory framework, it is recommended that the government and the NCA undertake comprehensive consultations and evidence-based decisions. These should balance the objectives of enabling digital and technology innovation and providing certainty to enable licensees to continue making significant and long-term investments in infrastructure and services. This includes implementation of recent policy directions by the Minister for Communication, Digital Technology and Innovation to proceed with technology neutral licensing for all mobile operators and the assignment of additional spectrum.

2. Licensing and regulatory "level playing field" framework for electronic communications application services, including Over The Top (OTT) services, and emerging electronic communications infrastructure, such as Low Earth Orbit (LEO) satellites

An update of the regulatory framework that governs the digital economy is an opportunity to address policy issues arising from the entry of new technologies and business models into the market. For example, the financial impact of OTT services on infrastructure-based network operators is well recognised. The increased competition and innovation from the entry of OTT players into the market has benefited customers with new services and innovation. Similarly, the suite of communications services provided by new networks such as LEO satellites directly competes with traditional network operators, both fixed and mobile.

These developments have implications for the extent to which mobile operators can continue investing in expanding and updating networks. This, combined with the difficult operating environment for network infrastructure, means that future levels of industry capex are likely to be threatened.

Modernisation of the regulatory framework is an opportunity to create a level playing field for all players in the sector, support future financial sustainability of the sector and contribute to Ghana's digital economy. If the regulatory framework is used to encourage collaboration by players in the digital ecosystem, then the benefits would be felt in the form of more investment into network infrastructure and greater service innovation for customers.

3. Promoting new technologies, such as AI, cloud, and quantum computing

AI is a rapidly evolving technology with implications for regulatory authorities around the world. Some instances of the implications are summarised in the GSMA's Responsible AI (RAI) Maturity Roadmap and the G20 AI Principles and programmes undertaken during Brazil's G20 Presidency in 2024 (Box 13).

Box 13: Extract from Brazilian G20 Presidency supported by UNESCO: Recommendations on enabling resources for the development, deployment, and use of AI for good and for all

1. Promote international collaboration and multistakeholder partnership

Enhancing exchanges on policies with a view to fostering interoperable frameworks to promote safe, secure, and trustworthy development and deployment of AI systems in an ethical and responsible way. These frameworks should promote economic growth, technological cooperation and development, as well as safeguard human rights, fundamental freedoms, inclusiveness, equity and accessibility. They should also enhance social welfare, facilitate interoperable approaches to AI to reduce inequalities and foster inclusive sustainable development. This can help to effectively address challenges and mitigate the risks related to it, including those related to personal data protection, privacy, consumer protection and data governance, placing AI at the service of individuals, economies, societies and the planet.

2. Enhance AI enabling environments and capability building

Strengthening AI enabling environments and enhancing AI capabilities through investments in technology and corresponding infrastructure, as well as in education and upskilling initiatives. Special emphasis should be placed on fostering collaboration with and providing targeted support to low- and middle-income countries and communities, to bridge digital divides, enhance AI-related resources, and improve countries' capacity to determine their own digital and AI future. Promoting cooperation at all levels of AI developments can help spur innovation and foster resilient AI ecosystems globally.

3. Develop governance frameworks and policies

Developing and implementing agile innovation-friendly and forward-looking governance frameworks and policies that promote digital and AI empowerment.

C. SUMMARY OF IMPACTS OF POLICY REFORMS

The policy recommendations outlined above could have a major positive impact on Ghana's digital economy. Supporting growth of the mobile sector by reducing sector-specific taxes, creating a sustainable investment environment, stimulating adoption of mobile internet and modernising the sector regulatory framework will boost mobile internet adoption. This will promote digitalisation throughout the economy as a whole which would bring with it economic benefits to the country.

The impact of changes in regulation and policy towards the sector are modelled by analysing how these changes would affect operators and users of mobile broadband and mobile money. The detailed results provided above are summarised in Table 18.

Table 18: Summary of model estimates

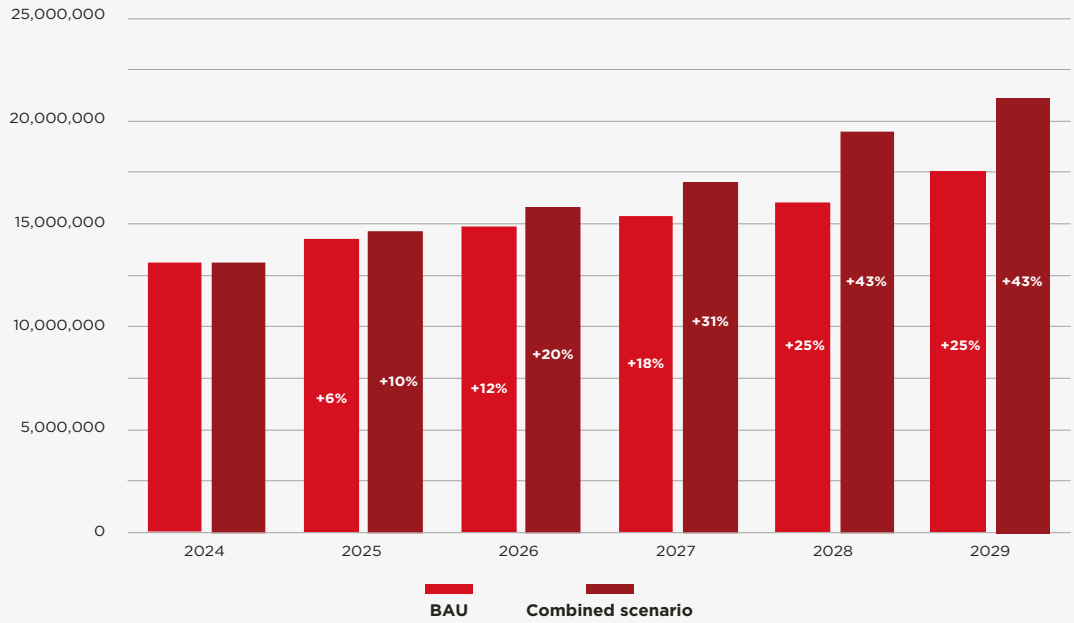
Challenge	Modelled Scenario and Impact	2029 increase in users vs BAU
1. Improving affordability and inclusivity of ICT and digital services by reducing sector-specific taxes on the mobile industry	**Reduce sector-specific taxes on the mobile industry** by removal of the CST and import duties on handsets, together with a reduction in revenue-based taxes and fees on operators. This will feed directly through to lower retail prices which will boost uptake and adoption of mobile broadband.	4% - 630,000 additional unique mobile internet users

2.	Increasing the reach and accessibility of digital services	**Create a sustainable investment environment for digital infrastructure** Creating a regulatory environment in which all operators can invest sustainably will help to achieve universal 4G coverage and significant 5G coverage. This will enable quality improvement and reduced cost of data, increasing mobile broadband adoption. The recommended measures include: • Spectrum policy and roadmap, including technology neutral approach and terms that promotes efficient assignment and investment in digital infrastructure, including a market-led approach to 2G and 3G network sunsetting. • Measures to provide more effective infrastructure deployment, energy supply, and protection against criminal damage. • Consultation to review barriers to address quality of service. • Stakeholder consultation on USF strategy, including usage gap analysis and other recommendations in this report.	3% - 490,000 additional unique mobile internet users
3.	Expanding the use of the internet by Ghana citizens	**Improve device affordability and promote digital adoption** Adoption and usage of mobile internet and mobile money is also affected by demand-side factors. Increased demand increases adoption and usage ceteris paribus. Policies aimed at supporting demand and closing the usage gap include interventions such as device affordability, digital skills training programmes, business support for SMEs, digitalisation of government services, programmes to increase adoption of new technologies by business and consumers, including mobile money.	13% - 2.2m additional unique mobile internet users
4.	Encouraging digital transformation	**Modernise the digital regulatory framework** The following areas should be addressed in the ongoing review of the regulatory framework by the Government: • Licensing to provide certainty to existing licensees and enable continued investment and innovation. • Licensing and regulatory "level playing field" framework for electronic communications application services, including OTTs, and emerging electronic communications infrastructure, such as Low Earth Orbit (LEO) satellites. • Promoting new technologies, such as AI, cloud, and quantum computing.	Not estimated

The base case scenario shows a steady increase in mobile broadband. In this scenario, the number of unique mobile internet users is forecasted to increase from 13.1 million in 2024 to 17.3 million in 2029.

The combined impact of the policy recommendations would significantly increase the number of new mobile internet users in Ghana, from 4.1 million new unique users in the base case to 7.4 million by 2029 in the combined scenario. This is a 57% increase on the 2024 user base. Figure 21 and Table 19 below show outputs from modelling the combined impact of mobile internet uptake policies.

Figure 21: Policy reform combined scenario, number of mobile internet unique users



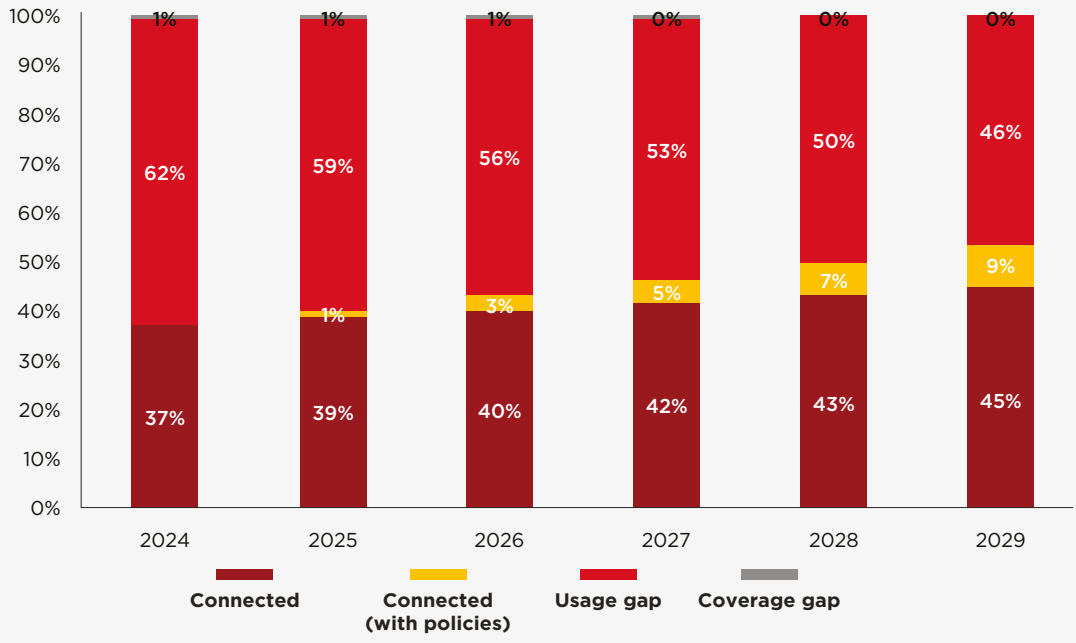
Source: See Methodology Document that accompanies this report.

Table 19: Impact of policy recommendations on internet uptake

Mobile internet users (m)	2024	2025	2026	2027	2028	2029
BAU	13.15	13.90	14.68	15.51	16.37	17.28
Combined policies	13.15	14.41	15.77	17.26	18.86	20.59
Y-on-Y difference to BAU	0%	4%	7%	11%	15%	19%
Increase in growth vs BAU	0%	+4%	+8%	+13%	+19%	+25%

As a result of this increase in mobile internet uptake, the usage gap could be reduced. By 2029, Ghana is projected to have close to 100% mobile internet coverage. However, without these policies, only 45% of the Ghanaian population is forecasted to use the internet despite being covered, resulting in a usage gap of 55%. The impact of the proposed policies would be to increase the proportion of the population using mobile broadband from 45% to 54%, a reduction of the usage gap by 9 percentage points (Figure 22).

Figure 22: Evolution of mobile internet connectivity in Ghana, subject to policy reforms



Source: See Methodology Document that accompanies this report.


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5. Policy Recommendations

5. POLICY RECOMMENDATIONS

In order to realise the full potential of digital transformation in Ghana, policy reforms must balance short-term objectives with long-term investment and development. **Wide-ranging benefits of digitalisation will require bold actions to support demand, reduce the cost of supply and promote a policy environment that supports investment** towards the collective goals of digital transformation and universal connectivity.

The economic and social value of digital and emerging technologies relies on mobile as the backbone of digitalisation of the economy. The mobile industry is best positioned to partner with the Government in achieving a mission-oriented public policy that can catalyse innovation across multiple sectors in the economy.

This report has identified four key policy recommendations to support the growth of Ghana's digital economy. These are summarised below in Table 20. Each of these policies could increase the number of internet users, contribute to achieving the digital transformation desired by the Government of Ghana, and lead to the economic benefits laid out in section 4C above.

Table 20: Policy Recommendations

Policy Recommendation	Expected Imapct
Improving affordability and inclusivity of ICT and digital services by reducing sector-specific taxes on the mobile industry	Reducing sector-specific taxes on the mobile industry and mobile consumers will feed directly into lower retail prices which will boost uptake and adoption of mobile broadband.
Increasing the reach and accessibility of digital services	Creating a market structure in which all operators can invest sustainably and reduce costs has the potential to achieve universal 4G coverage and significant 5G coverage. This would allow both quality improvement and reduced cost of data, thus increasing mobile broadband adoption. Achieving this objective will require: • A spectrum policy and roadmap that promotes technology neutrality, and efficient assignment and investment in digital infrastructure. Including a market-led approach to 2G and 3G network sunsetting. • Measures to provide more effective infrastructure deployment, energy supply, and protection against criminal damage. • Consultation to review barriers to address quality of service. • Stakeholder consultation on USF strategy, including usage gap analysis and other recommendations in this report.
Expanding the use of the internet by Ghana citizens	Adoption and usage of mobile internet and mobile money is also affected by demand-side factors. Increased demand increases adoption and usage ceteris paribus. Policies aimed at supporting demand and closing the usage gap could include interventions such as device affordability, digital skills training programmes, business support for SMEs, digitalisation of government services, and programmes to increase adoption of new technologies by business and consumers, including mobile money.
Encouraging digital transformation	The Government has an ongoing consultation to review the existing legislative and regulatory framework, and the development of new digital transformation and AI strategies. Key areas to address include: • Licensing regulatory framework which provides certainty to existing licensees to enable continued investment and innovation to achieve digital socio-economic objectives. • Licensing and regulatory "level playing field" framework for electronic communications application services, including OTTs, and emerging electronic communications infrastructure, such as LEO satellites. • Promoting new technologies, such as AI, cloud, and quantum computing.

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