

# The Mobile Economy Middle East & North Africa 2024



# GSMA

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# Executive summary

## Driving growth and innovation

The mobile industry continues to underpin rapid digital transformation in the Middle East and North Africa (MENA), with advanced mobile networks enabling innovative use cases for consumers and enterprises. The role of mobile infrastructure and services will become even more vital to the way society functions as governments increasingly use digital technologies to tackle some of the most pressing social and economic challenges.

The impact of mobile connectivity is evidenced by its contribution to the economy. In 2023, mobile technologies and services generated 5.5% of MENA's GDP, a contribution that amounted to \$310 billion of economic value added, and supported around 1.3 million jobs across the region. By the end of 2023, 427 million people

in MENA (64% of the population) subscribed to a mobile service. Growth in mobile internet penetration has been remarkable. At the end of 2023, 49% of the region's population used mobile internet, equating to just under 327 million users – almost triple the figure a decade earlier.

However, large swathes of the population across the region still remain unconnected, most of them within the usage gap.<sup>1</sup> Addressing the usage gap is crucial to closing the digital divide and enabling life-enhancing applications around finance, health and education. Moreover, mobile connectivity continues to serve as a lifeline for individuals and communities facing violent conflicts across the region, as well as a platform for government and other stakeholders to deliver much-needed humanitarian relief.

1. People covered by a mobile broadband network but do not yet subscribe to a mobile internet service



# Key trends shaping the mobile ecosystem

## 5G's next phase

The Gulf Cooperation Council (GCC) Arab states are among the global leaders in the development of 5G. The technology in these markets benefits from a forward-looking policy environment, which stimulates investments in advanced network solutions, and a customer base with high levels of readiness and willingness to adopt new services. Operators in these markets are also shifting their focus to more advanced forms of 5G to unlock new use cases and monetisation opportunities. In particular, operators have begun deploying 5G networks based on the standalone (SA) architecture while trialling 5G-Advanced and 5G reduced capability (RedCap) technologies to deliver new solutions for enterprises. Elsewhere in MENA, 5G has made little progress, with commercial services available only in four other countries.

## GSMA Open Gateway gains traction

By the end of June 2024, 53 operator groups had signed up to the GSMA Open Gateway, representing 240 mobile networks and accounting for 67% of mobile connections globally. Between the participating operators, all regions are covered, with Du, e&, Omantel, STC and Zain among the operators in MENA to sign up to the initiative. As in other regions, early GSMA Open Gateway launches in MENA have focused on fraud prevention and security, using APIs such as Device Status, One Time Password SMS and SIM Swap. These can represent quick wins, given the ever-present risks from fraudsters and breaches for operators and their customers. Other parts of the API library (e.g. Quality on Demand) will be deployed in the coming years as operators expand their rollouts of 5G SA and other enabling technologies.





## Momentum builds behind aerial connectivity

The deserts and mountain ranges in several countries in MENA mean that aerial connectivity will play an important role in realising universal connectivity, especially for communities in remote and sparsely populated areas. While there has historically been significant interest in aerial solutions in the region, the emergence of low Earth orbit (LEO) and high-altitude platform station (HAPS) solutions have increased the interest in satellites and non-terrestrial networks (NTNs). This has ushered in a new era of collaboration between telecoms and satellite operators for solutions spanning several use cases, including remote area connectivity, disaster response and maritime services.



## Growing investments and use cases with generative AI

Operators in the region are increasingly adopting generative AI (genAI) across operational and business areas, driving internal transformation and new business opportunities. GenAI is being used to enhance customer service through chatbots, virtual assistants and personalised marketing; at the same time, it is being used to improve network performance via predictive maintenance and automated solutions. Many strategic collaborations are underway to help operators maximise the value of this new technology. Investments in AI-supporting infrastructure are growing, with telecoms operators expanding data centres to fuel AI research and development, particularly in the GCC region. However, data privacy concerns and the shortage of skilled AI professionals, among other challenges, remain key barriers to AI adoption.

## Mobile money for humanitarian relief

Mobile operators are at the forefront of facilitating humanitarian relief through both connectivity and mobile financial services, such as mobile wallets and mobile money. In areas affected by conflict, displacement and economic instability, where traditional financial systems are often disrupted, mobile connectivity becomes a lifeline, enabling people to access vital digital financial services to avail aid. By offering mobile money services alongside emergency relief efforts, operators not only address immediate needs but also promote long-term financial inclusion and resilience for vulnerable populations.



## Policies for success

The mobile industry in MENA has shown resilience in the face of a myriad of macroeconomic challenges, such as hyperinflation and international conflicts. At the same time, operators have remained committed to investing in high-performance networks, including 5G, to support the digitalisation agenda of governments in the region, despite slowing revenue growth rates and tightening margins. In this context, policymakers in the region have a role to play to sustain the continued advancement of the mobile industry. In particular, there is a case for policymakers in the region to address the widening investment gap for telecoms infrastructure, rising taxes and regulatory fees and costly quality-of-service (QoS) regulations, in addition to encouraging voluntary infrastructure sharing to ease the cost burden of network operations.

Meanwhile, decisions achieved at the World Radiocommunication Conference 2023 (WRC-23) will have a major impact on the future of mid-band spectrum. Final harmonisation of the 3.5 GHz band (3.3–3.8 GHz) – the pioneering 5G band – was achieved across Europe, the Middle East and Africa (EMEA) and the Americas. This step will allow more countries to take advantage of economies of scale in the mobile ecosystem and benefit from higher speeds provided by wide spectrum channels in this range.

The conference also identified 6 GHz (6.425–7.125 GHz) for mobile use by countries in every region – EMEA, CIS, the Americas and Asia Pacific – and global, harmonised conditions for its use have been agreed in the ITU's Radio Regulations. The identification brings together billions of people into a harmonised 6 GHz mobile footprint. It also serves as a critical developmental trigger for manufacturers of the 6 GHz equipment ecosystem.

# The Mobile Economy Middle East & North Africa

## Unique mobile subscribers



2023

**427m**

64% penetration rate\*

2030

**517m**

71% penetration rate\*

CAGR  
2023-2030

**2.4%**

\*Percentage of population

## Mobile internet users



2023

**327m**

49% penetration rate\*

2030

**422m**

58% penetration rate\*

CAGR  
2023-2030

**3.2%**

\*Percentage of population

## SIM connections

(excluding licensed cellular IoT)



2023

**716m**

108% penetration rate\*

2030

**874m**

120% penetration rate\*

CAGR  
2023-2030

**2.5%**

\*Percentage of population

## 4G

Percentage of connections  
(excluding licensed cellular IoT)

2023

**60%**

2030

**35%** ↓

## 5G

Percentage of connections  
(excluding licensed cellular IoT)

2023

**4.3%**

2030

**50%** ↑



## Smartphones

Percentage of connections



2023

81%

2030

90%<sup>↑</sup>

## Operator revenues and investment



2023

\$66bn

Total revenues

2030

\$88bn

Total revenues

Operator capex  
for the period  
2023-2030:

\$97bn

## Licensed cellular

## IoT connections



2023

48m

2030

78m

## Mobile's contribution to GDP



2023

\$310bn

5.5% of GDP

2030

\$360bn

## Public funding



2023

\$20bn

Mobile ecosystem contribution to public funding (before regulatory and spectrum fees)

## Employment



2023

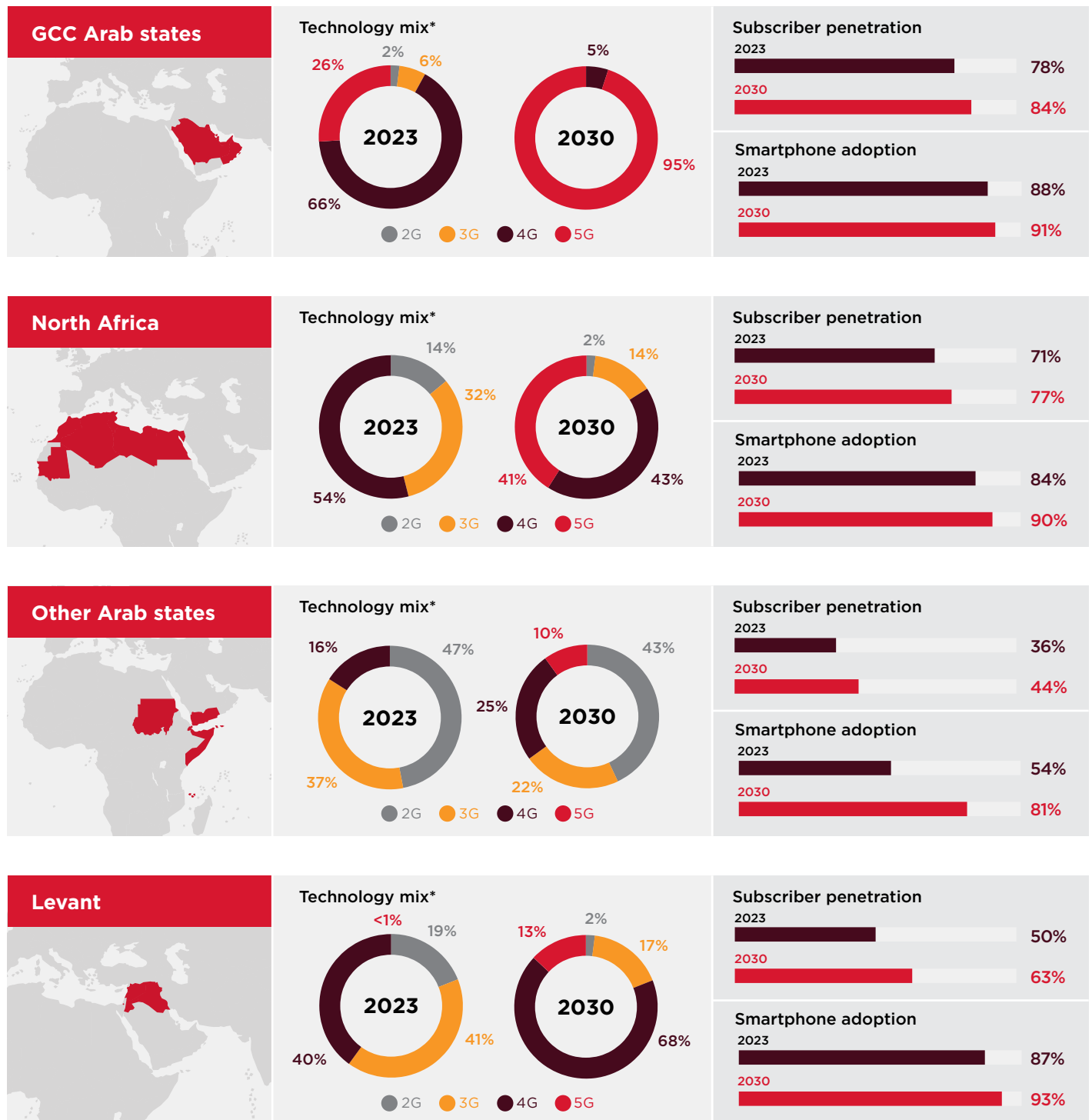
500k jobs

Directly supported by the mobile ecosystem



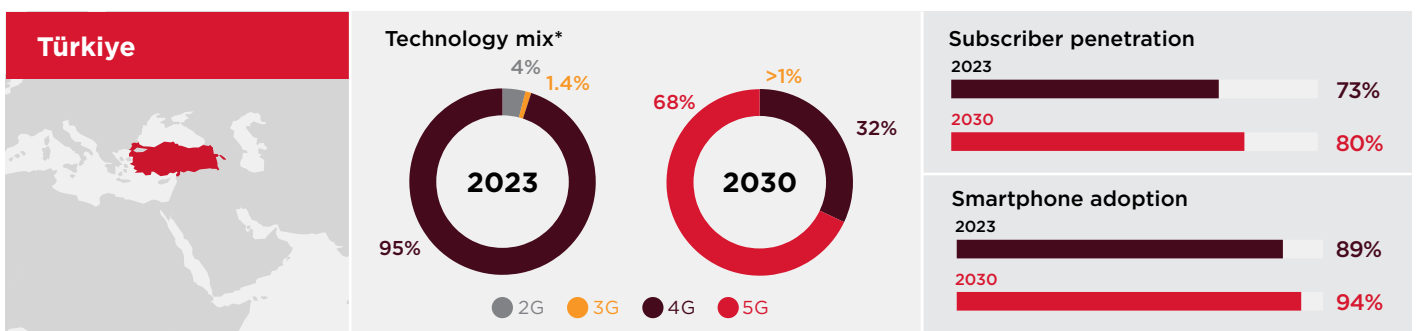
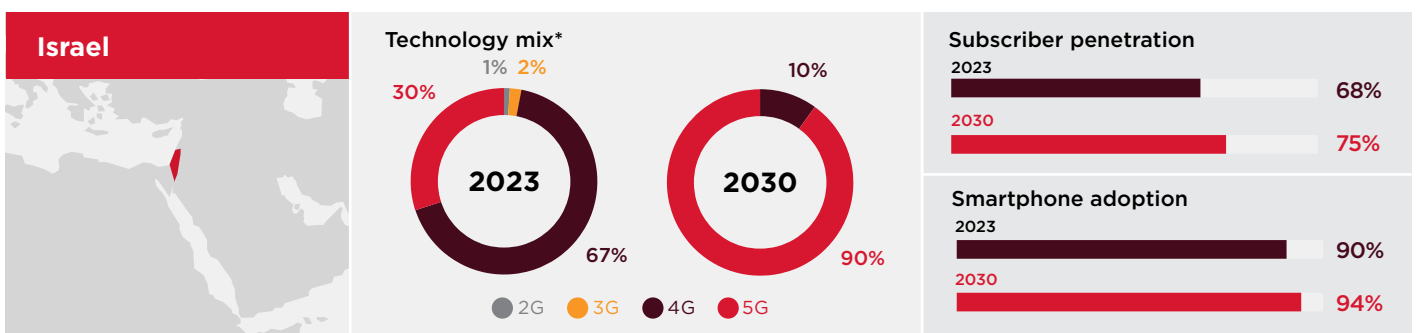
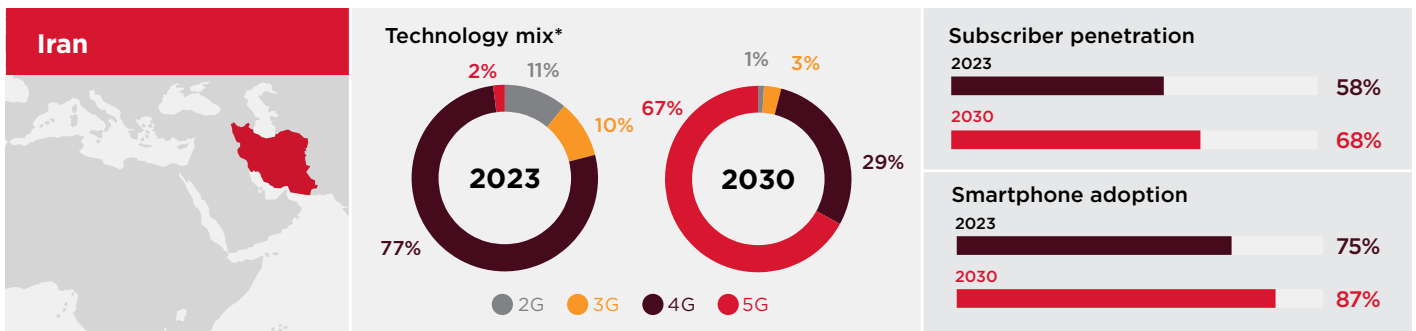
Plus 700k indirect jobs

# Subscriber and technology trends for key markets



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

# Subscriber and technology trends for key markets



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



# 01

## The mobile industry in numbers



# Almost half of the population in MENA now subscribe to mobile internet services

By the end of 2023, 327 million people in MENA (49% of the population) subscribed to a mobile service – an increase of 160 million people since 2015. Although the usage gap remains substantial, it has narrowed by 2% since 2020. This has been driven by the widespread availability of affordable data plans and some of the lowest-cost internet-enabled handsets in the region.

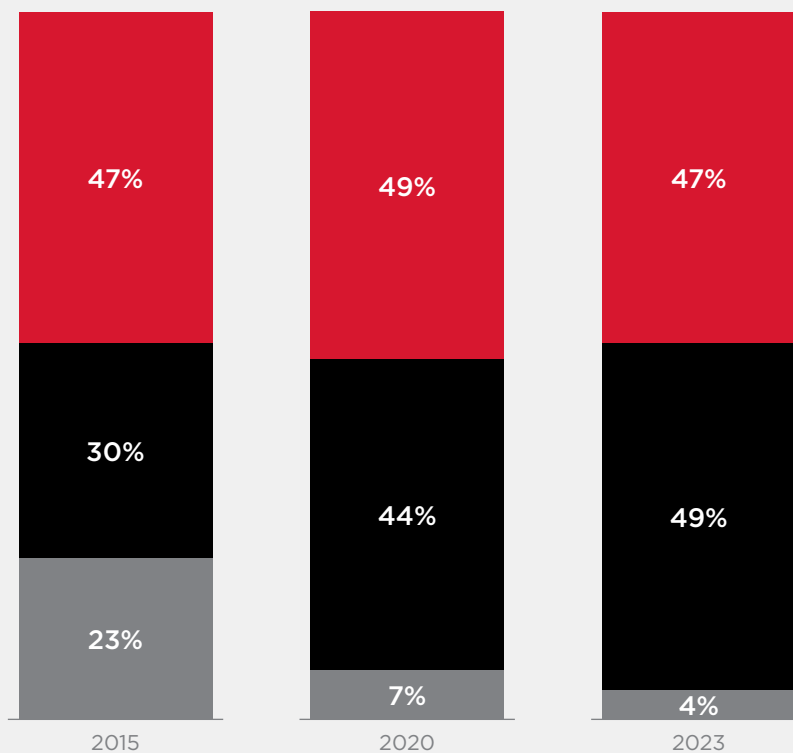
The rapid growth of digital services and large proportion of young people in the MENA region mean that online content is poised to become a key driver of mobile internet adoption in the coming years.

Figure 1

## MENA: mobile internet connectivity

Percentage of population

Usage gap —  
Connected —  
Coverage gap —



Source: GSMA Intelligence

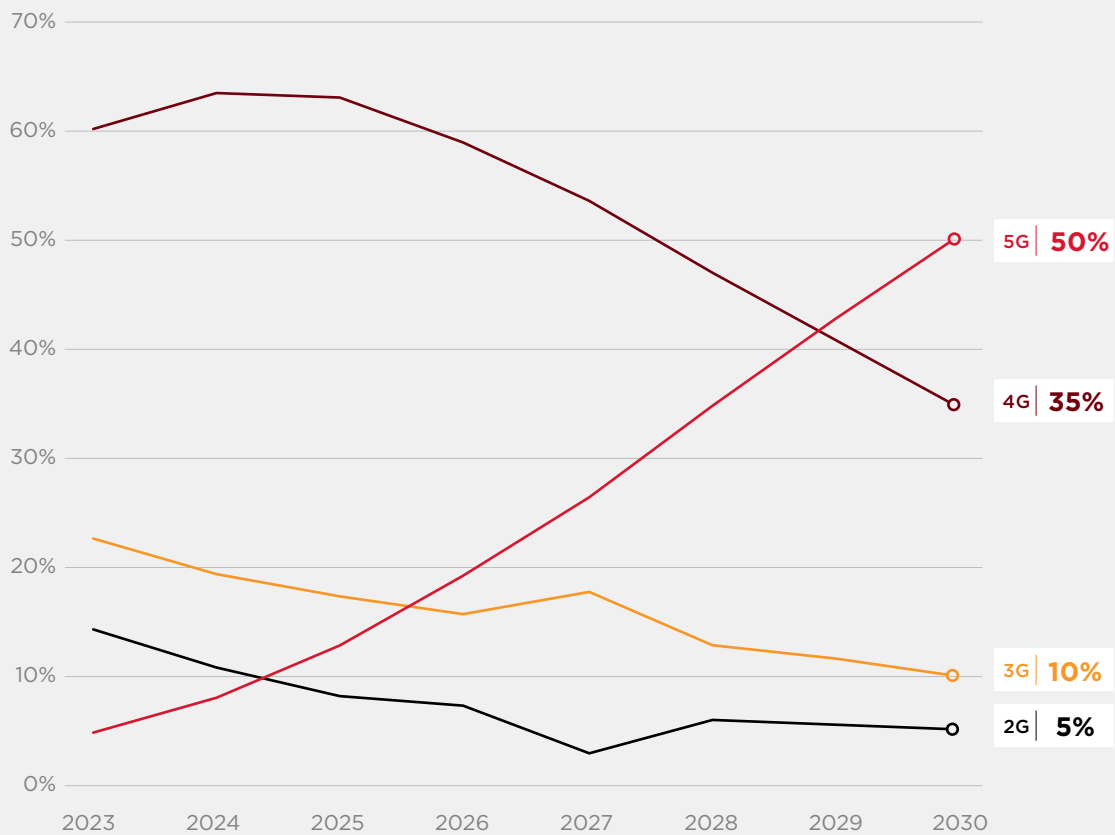
# 5G adoption in MENA will reach 50% by the end of 2030

5G adoption in the MENA region is set to accelerate from 2025 onwards, reaching half of the region's population by the end of the decade. The GCC states will continue to lead, with 5G forecast to cover 95% of the population in the GCC states by 2030, whereas other countries are still in the early stages of 5G deployment. By the end of this decade, 4G's share of total connections will decline, falling below that of 5G.

4G will remain the dominant technology in MENA for the coming years and will account for more than 50% of total connections until 2027. Meanwhile, legacy networks (2G and 3G) are gradually being phased out as countries repurpose spectrum for 4G and 5G.

Figure 2  
**MENA: mobile adoption by technology**

Percentage of total connections



Source: GSMA Intelligence



# By 2030, there will be 439 million 5G connections in MENA

The GCC states are among the global leaders in 5G adoption, with operators here increasingly focusing on deploying 5G SA networks while also preparing for 5G-Advanced. Smart cities present a significant opportunity for operators, with 5G positioned as the backbone for diverse applications. Recent agreements, such as the collaboration between Orange and the King Abdullah Financial District Development and Management Company in Riyadh, underscore the opportunity for mobile operators to expand their role in the smart city ecosystem.

5G adoption in the rest of MENA will lag behind, partly due to the delay in the commercial launch of the technology in several key markets. Operators continue to lay the groundwork for the introduction of commercial 5G services in North Africa. A recent example is the announcement from Telecom Egypt confirming the acquisition of a \$150 million 5G licence from the country's regulator.

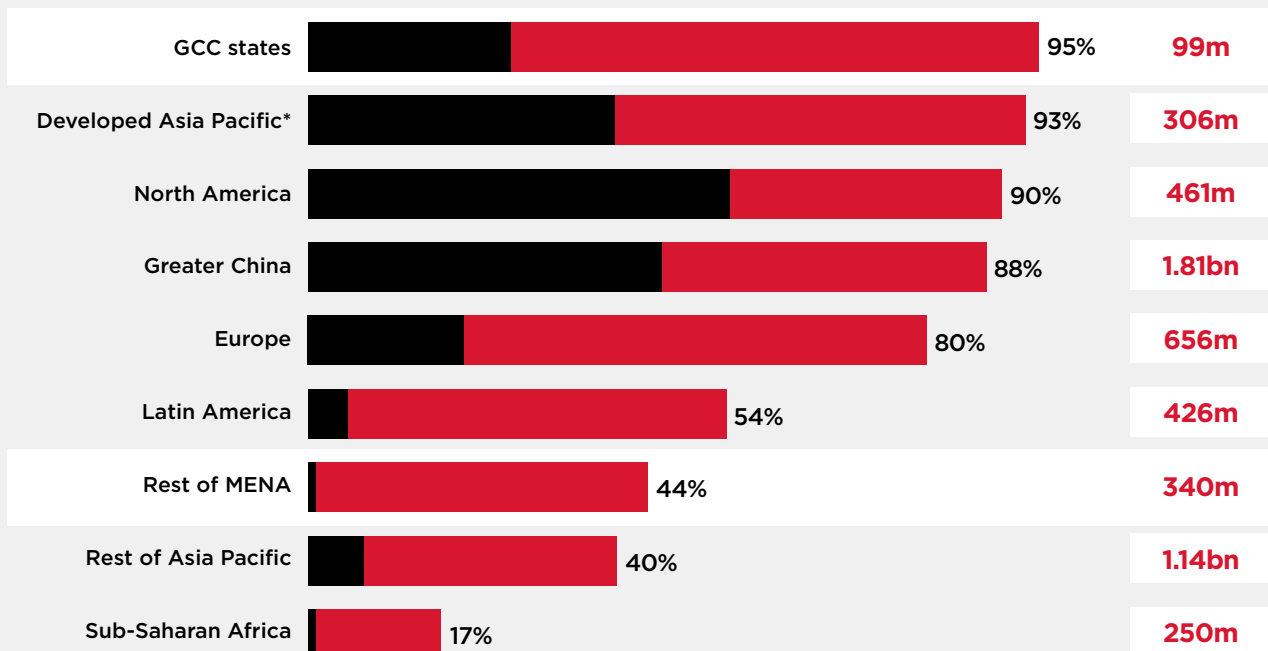
Figure 3

## 5G adoption in 2030

Percentage of total connections

2024-2030 increase —  
2023 —

5G connections  
(2030)



\*Includes Australia, Japan, New Zealand, Singapore and South Korea  
Source: GSMA Intelligence

# Mobile data traffic per connection will triple between 2023 and 2030

Mobile data traffic per connection is projected to increase threefold between the end of 2023 and 2030 in MENA. This growth has been primarily driven by the rising consumption of online content among the region's large population of young people, who are increasingly engaging with activities such as gaming, video streaming, e-commerce and social networking.

Although mobile data traffic growth is expected to moderate in the coming years, the GCC states will continue to dominate the market share. Meanwhile, North Africa and the Levant are expected to experience more than a fourfold increase in data traffic.

Figure 4

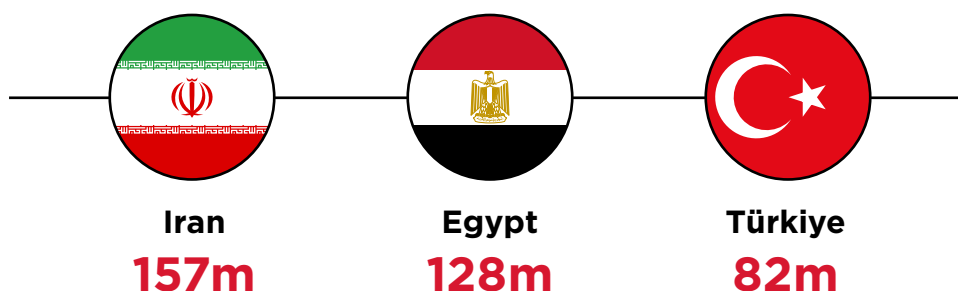
## MENA: mobile data traffic per connection

GB per month

Region	2023	2030	Increase
MENA	9.4	29.9	<b>3.2x</b>
North Africa	5.1	21.1	<b>4.1x</b>
GCC Arab states	24.4	81.7	<b>3.4x</b>
Other Arab states	1.1	3.9	<b>3.7x</b>
Levant	2.8	11.6	<b>4.2x</b>

### Top three smartphone markets in MENA

(number of smartphone connections, 2030)



Source: GSMA Intelligence

# Licensed cellular IoT connections in MENA will almost double between 2023 and 2030

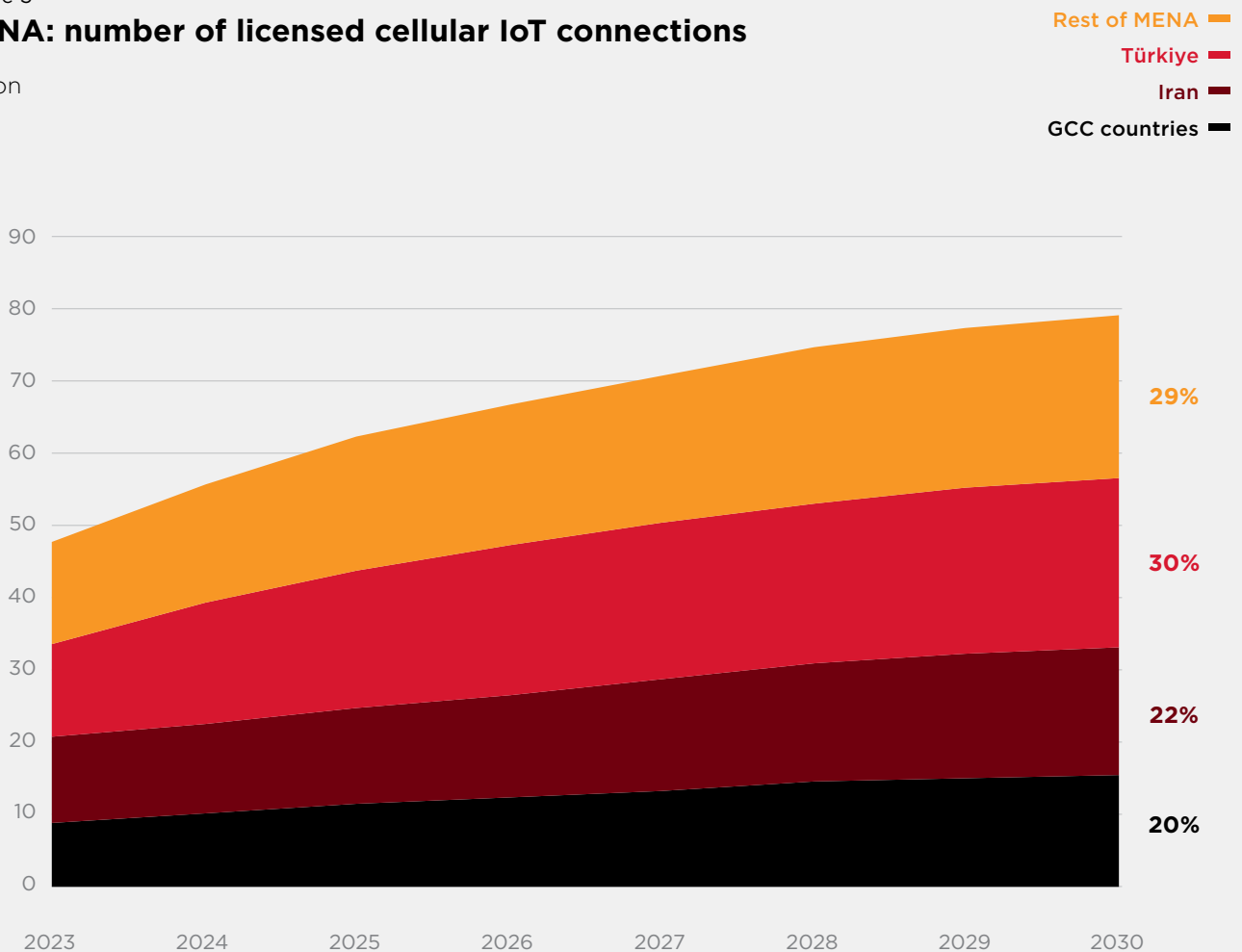
By 2030, there will be almost 80 million licensed cellular IoT connections in MENA, with Türkiye and Iran together accounting for more than half of these. IoT connections will be boosted by the growing number of 4G, and eventually 5G, connections in the region, as advanced connectivity will enable new use cases. To address the diverse needs of IoT use cases, operators will leverage a combination of connectivity options. This will help ensure optimised performance across different applications.

For example, there is growing interest among operators in 5G RedCap technology, which can serve as an important enabler for mid-tier cellular IoT applications. In July 2024, e& and Ericsson successfully conducted end-to-end verification of a RedCap software solution on e&'s 5G SA network.

Figure 5

## MENA: number of licensed cellular IoT connections

Million



Source: GSMA Intelligence



# By 2030, mobile revenues in MENA will reach \$88 billion

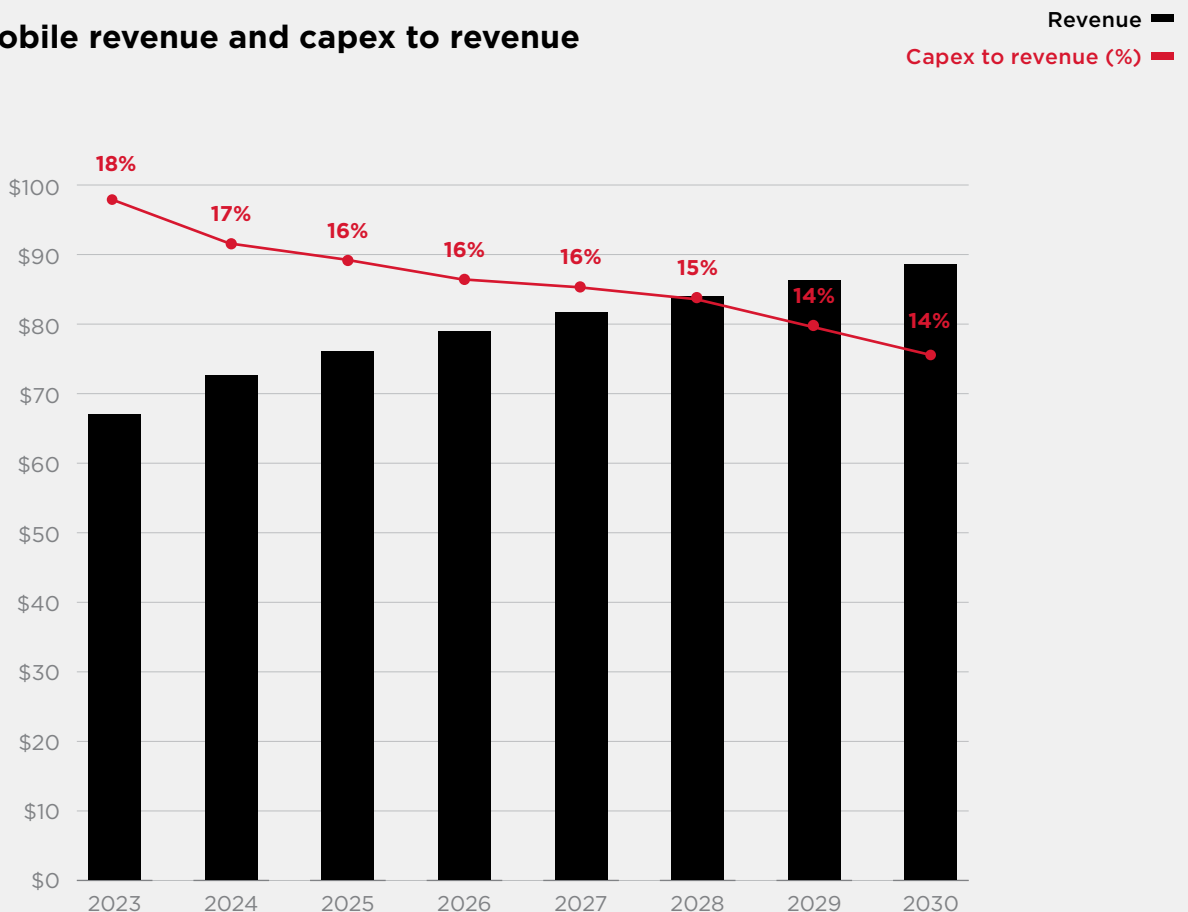
Mobile revenue is expected to grow steadily in MENA as operators continue diversifying services. Mobile capex to revenue in the region was 17% at the end of 2022, likely marking the peak of 4G investment and the start of the 5G investment cycle. The introduction of 5G services has driven incremental revenues in areas such as 5G fixed wireless access (FWA) and private 5G.

Services beyond core are becoming an increasingly important part of the growth story for operators in MENA. According to a GSMA Intelligence survey, 57% of operators in 2023 cited the public cloud as one of their top three strategic enterprise technology priorities, behind only edge computing and network slicing. Operators and public cloud providers are becoming increasingly intertwined (e.g. e& and Microsoft's partnership), with operators seeing web-scalers as crucial to generating new revenue opportunities in addition to supporting internal transformation programmes.

Figure 6

## MENA: mobile revenue and capex to revenue

Billion



Source: GSMA Intelligence

# The mobile sector added \$140 billion of economic value to the MENA economy in 2023

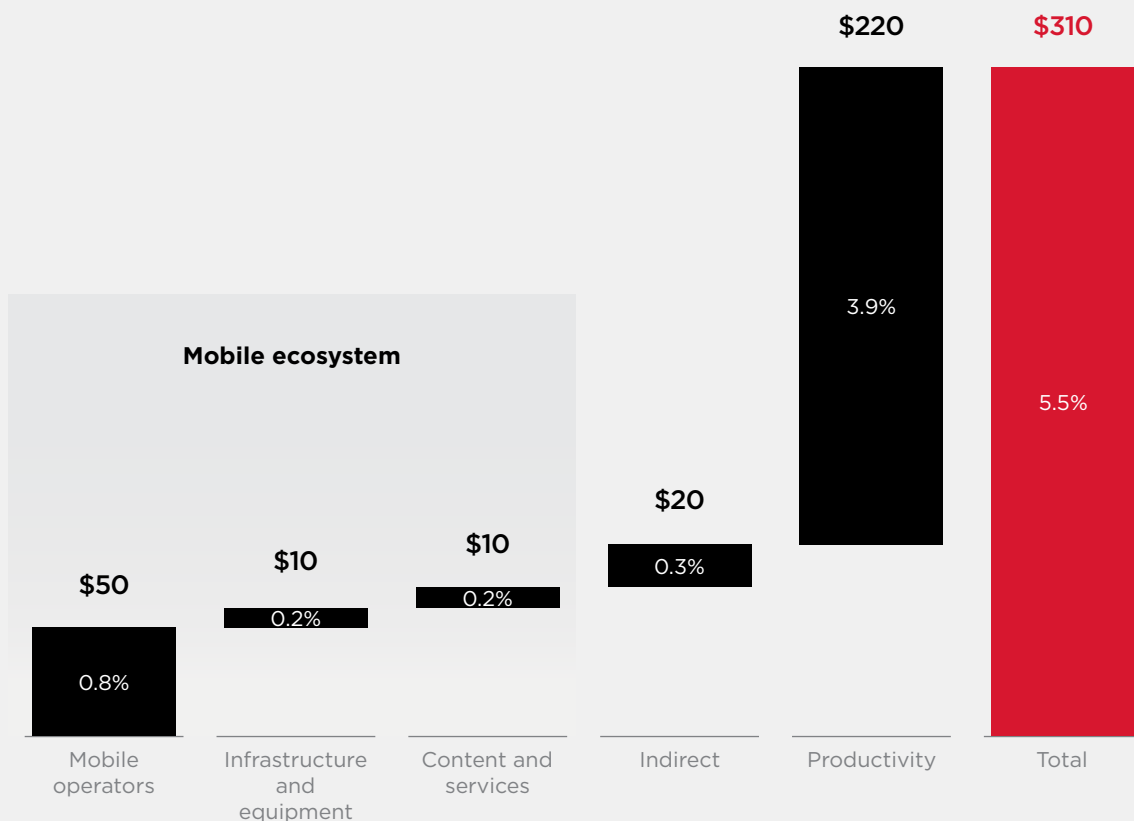
In 2023, mobile technologies and services generated 5.5% of GDP across MENA, a contribution that amounted to \$310 billion of economic value added. The greatest benefits came from the productivity effects generated by the use of mobile services across the economy reaching \$220 billion. The direct contribution by the mobile industry ecosystem was also significant at \$70 billion.

The mobile ecosystem comprises three categories: mobile operators; infrastructure and equipment providers; and content and services. The infrastructure and equipment category includes network equipment providers, device manufacturers and IoT companies. Meanwhile, the content and services category encompasses content, mobile application and service providers, distributors and retailers, and mobile cloud services.

Figure 7

## MENA: total economic contribution of mobile, 2023

Billion, percentage of 2023 GDP



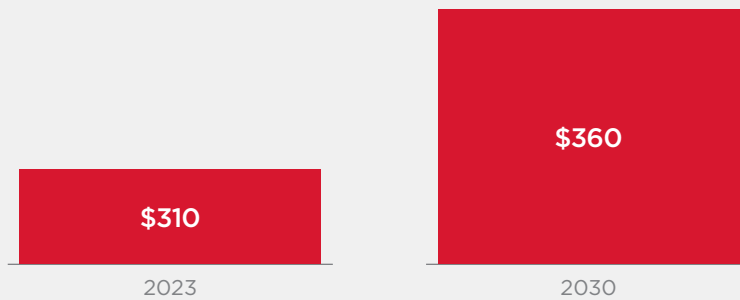
Note: Totals may not add up due to rounding.  
Source: GSMA Intelligence

# By 2030, mobile's economic contribution in MENA will reach \$360 billion

By 2030, mobile's contribution will reach \$360 billion in MENA, driven mostly by the continued expansion of the mobile ecosystem and verticals increasingly benefiting from the improvements in productivity and efficiency brought about by the take-up of mobile services.

Figure 8  
**MENA: economic impact of mobile**

Billion



Source: GSMA Intelligence

# The mobile ecosystem in MENA supported around 1.3 million jobs in 2023

Mobile operators and the wider mobile ecosystem provided direct employment to more than 500,000 people in MENA in 2023. In addition, economic activity in the ecosystem generated roughly 700,000 jobs in other sectors, meaning around 1.3 million jobs were directly or indirectly supported.

Figure 9  
**MENA: employment impact of the mobile industry, 2023**

Jobs (million)



Note: Totals may not add up due to rounding.  
Source: GSMA Intelligence

# The fiscal contribution of the mobile ecosystem in MENA reached \$20 billion in 2023

In 2023, the mobile sector in MENA made a substantial contribution to the funding of the public sector, with more than \$20 billion raised through taxes. The largest contribution came from services VAT, sales taxes and excise duties, which generated \$10 billion, followed by handset VAT, sales taxes, excise and customs duties at \$5 billion.

Figure 10

## MENA: fiscal contribution of the mobile ecosystem, 2023

Billion



Note: Totals may not add up due to rounding.  
Source: GSMA Intelligence



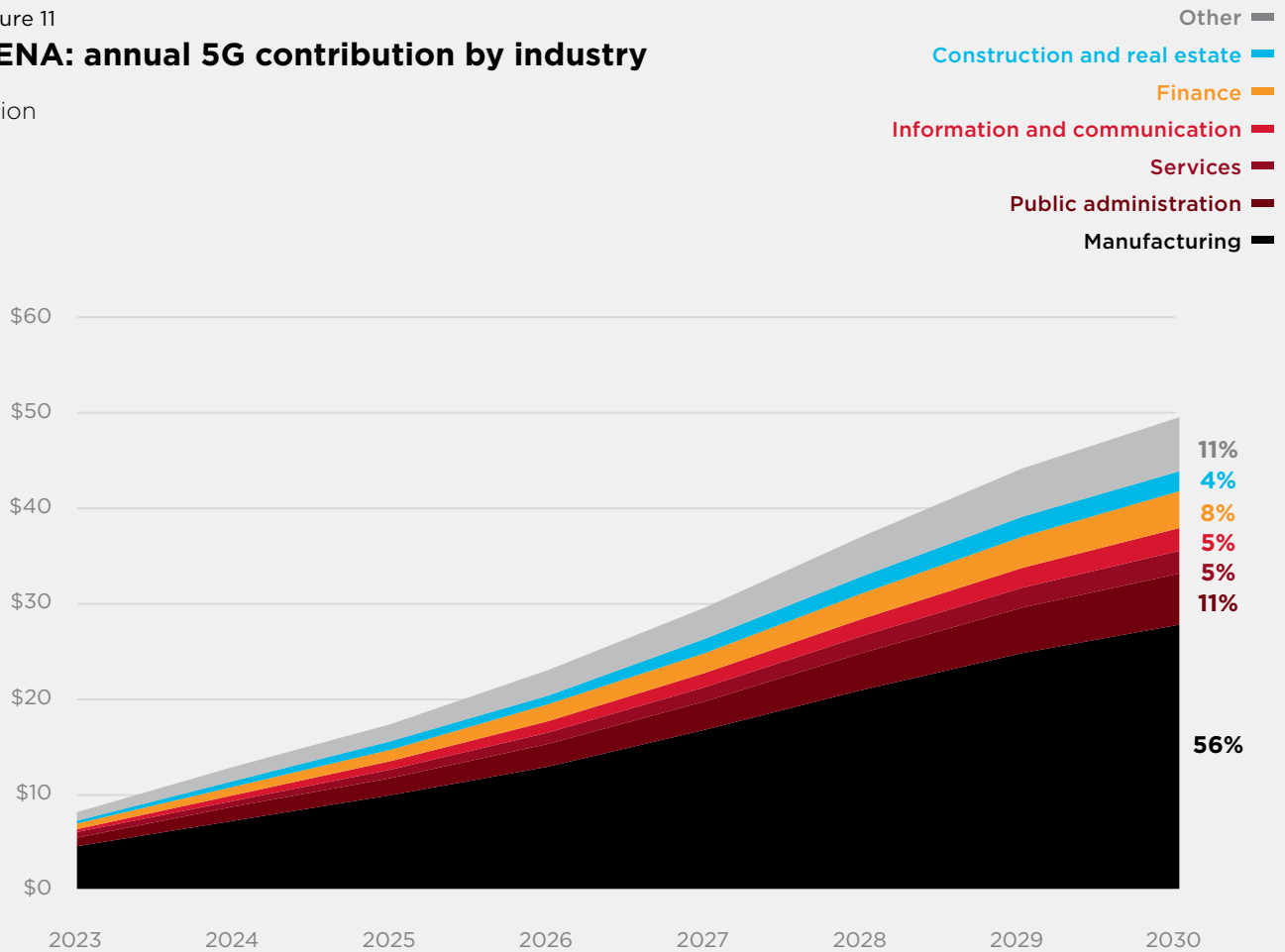
# 5G will add almost \$50 billion to the MENA economy in 2030

5G's contribution to the MENA economy is expected to be just under \$50 billion in 2030, accounting for more than 13% of the overall economic impact of mobile. Much of the 5G benefit will materialise over the second half of the decade to 2030. Some countries are in the early stages of deployment – the 5G economic benefits will increase as the technology starts to achieve scale and widespread adoption.

While 5G is expected to benefit most sectors of the MENA economy, some industries will benefit more than others due to their ability to incorporate 5G use cases in their business. Between 2023 and 2030, more than 50% of the benefits are expected to originate from the manufacturing sector, driven by applications such as smart factories, smart grids and IoT-enabled products. Other sectors that will experience significant benefits are the public administration and finance sectors at 11% and 8%, respectively.

Figure 11  
**MENA: annual 5G contribution by industry**

Billion



Source: GSMA Intelligence

# 02

## Mobile industry trends



## 2.1

# 5G: the focus shifts to 5G-Advanced and 5G RedCap

As of September 2024, 285 operators in 114 markets had launched commercial 5G services. GSMA Intelligence data shows that the number of 5G connections will reach 2 billion globally by the end of 2024, accounting for nearly a quarter of total mobile connections. In several pioneering countries, notably China, South Korea and the US, 5G adoption has reached mass-market levels. In the US, for example, 5G is expected to account for nearly two thirds of total connections by the end of this year.

The GCC Arab states are among the global leaders in the development of 5G. Kuwait (ranked first) and the UAE (ranked second) were the top-ranked countries in the GSMA Intelligence 5G Index,<sup>2</sup> which provides a comprehensive assessment of 5G in 39 markets around world, while Qatar (ranked fifth) and Saudi Arabia (ranked 12th) were also in the top 15 countries. 5G technology in these markets benefit from a forward-looking policy

environment, which stimulates investments in advanced network solutions, and a customer base with high levels of readiness and willingness to adopt new services. Elsewhere in MENA, 5G has made little progress, with commercial services available only in four other countries (Jordan, Iran, Israel and Somalia).

FWA has emerged as a top 5G use case, with several operators offering the service alongside their 5G mobile services. A recent report<sup>3</sup> by Ericsson showed high levels of satisfaction among FWA users in Saudi Arabia, with four out of five households choosing FWA as a full replacement for previously used connectivity. In the UAE, Du has doubled its share in the broadband market to 30%; it attributes this and the associated broadband revenue growth to its FWA offering.<sup>4</sup> The operator has launched specialised FWA products for consumers and enterprises, including an FWA package aimed at gamers.

## Advanced 5G technologies gain traction

Operators in the GCC are increasingly shifting their focus to more advanced forms of 5G to unlock new use cases and monetisation opportunities. In particular, operators have begun deploying 5G networks based on the SA architecture, which offers several capabilities, including network slicing – the flexibility of allocating network resources dynamically to specific service-level agreements. In MENA, as of June 2024, operators in four countries (Bahrain, Kuwait, Saudi Arabia and the UAE) had launched commercial 5G SA networks, while operators in four other countries (Israel, Oman, Qatar and Türkiye) had announced plans to do so.

Beyond the deployment of 5G SA networks, operators in the region are looking to leverage 5G-Advanced and 5G RedCap technologies to deliver new solutions for enterprises. 5G-Advanced, as part of 3GPP Release 18 in 2024, is the next milestone in the 5G era and is set to enhance mobility by enabling uplink and multicast at better latency, increasing accuracy for extended reality (XR) applications and improving the reliability of AI/machine-learning (ML) data-driven designs. Insights from the GSMA Intelligence Network Transformation Survey 2023 show that 5G multicast and low-cost IoT top the list of 5G-Advanced use cases for operators (Figure 12).

2. [The State of 5G 2024](#), GSMA Intelligence, 2024

3. "Ericsson ConsumerLab Report reveals households in KSA highly prefer 5G Fixed Wireless Access", Ericsson, March 2024

4. "Du to bolster FWA 5G play to challenge rival", Developing Telecoms, February 2024

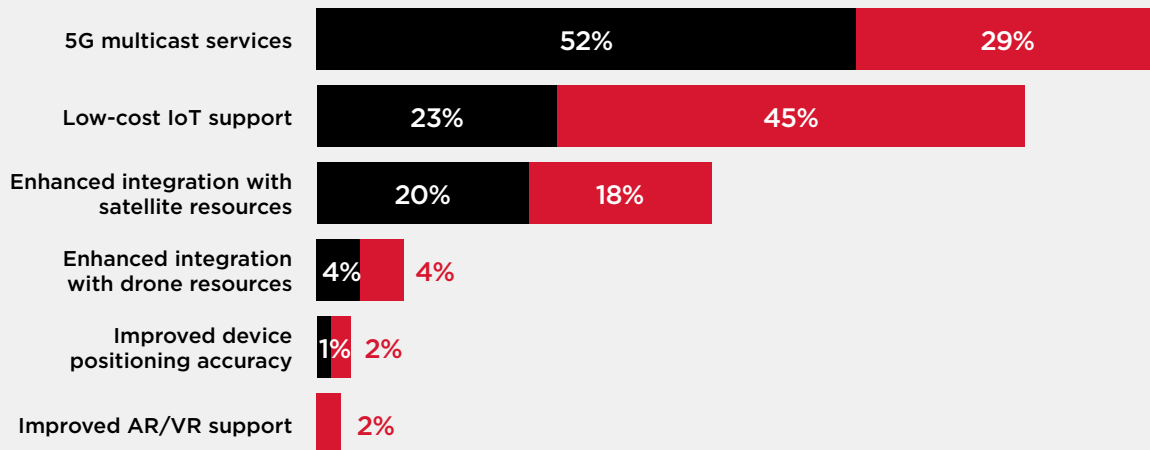
Figure 12

## 5G-Advanced: priority use cases

Rank 1 ■  
Rank 2 ■

Which 5G-Advanced use cases and applications are most important to your network transformation priorities? (Top two choices)

Percentage of operators (globally)



Source: GSMA Intelligence Operators in Focus: Network Transformation Survey 2023

Meanwhile, 3GPP Release 17 introduced the RedCap user equipment category for energy- and cost-efficient 5G IoT connectivity (also known as 5G NR-Light). In comparison to 5G enhanced mobile broadband (eMBB) devices that can deliver gigabits per second throughput in both the downlink and uplink, RedCap devices efficiently support 150 Mbps and 50 Mbps in the downlink and uplink, respectively. The reduced complexity of RedCap devices contributes to cost efficiency, a smaller device footprint and longer battery life due to lower power consumption.

5G RedCap is an important enabler for mid-tier cellular IoT applications; it serves as a platform for the successful migration of IoT applications to 5G networks in order to take advantage of the benefits of 5G beyond just speed. A range of use cases will benefit from RedCap, notably wearables, video monitoring and telematics. For example, most wearables support medium data rates in small form factors with relatively low power consumption, which is not achievable with eMBB or massive machine-type communications (mMTC). Also, many video applications for surveillance don't require eMBB's high data rates and so can benefit from the lower power consumption achievable with 5G RedCap.

**5G RedCap is an important enabler for mid-tier cellular IoT applications, serving as a platform for the successful migration of IoT applications to 5G networks in order to take advantage of the benefits of 5G beyond just speed**





Below are some examples of operator activities around 5G-Advanced and RedCap in the MENA region:

- In September 2024, **Du** and Huawei announced the deployment of an indoor 5G-Advanced network in the UAE to improve connectivity in indoor spaces such as shopping malls, hotels, airports and residential buildings.
- In July 2024, **STC** and Ericsson announced the implementation of automated radio resource partitioning on a 5G SA network slice, setting the stage for the operator to transition to a high-performing, programmable 5G-Advanced network.
- In July 2024, **e&** conducted an end-to-end verification of Ericsson's RedCap software solution on its 5G SA network. The operator plans to scale the RedCap implementation across its commercial network in the UAE, in line with the evolution towards 5G-Advanced.
- In June 2024, **Vodafone Qatar** achieved speeds of over 10 Gbps with 6 GHz spectrum as part of its phase-two trial on 5G-Advanced technologies. The trial showcased 5G-Advanced capabilities on the 6 GHz upper mid-band spectrum.
- In May 2024, **Zain Saudi Arabia** disclosed that it was investing SAR1.6 billion (\$425 million) to expand its 5G network and digital services ecosystem, with around 45% of the new expansion expected to support 5G-Advanced technologies.
- In March 2024, **STC Kuwait** announced the commercial deployment of RedCap FWA in collaboration with Huawei.
- In December 2023, **Du** and Nokia conducted a RedCap trial over the operator's commercial network.

The growing focus on 5G-Advanced and 5G RedCap has spurred a new round of 5G investments in 2024 and laid the foundation for the next wave of 5G use cases that could unlock new revenue streams for operators and the wider ecosystem in both the consumer and enterprise segments. More than half of respondents in the GSMA Intelligence Network Transformation Survey 2023 indicated that they plan to deploy commercial 5G-Advanced solutions and services within one year of the release of the 5G-Advanced standards.

## 5G development is still nascent in parts of MENA

The 5G landscape in MENA presents a mixed picture. Despite widespread 5G deployment and adoption in the GCC and other pioneering countries, the majority of countries in the region are on the other end of the 5G deployment spectrum. These include countries in North Africa and the Levant (with the exception of Jordan). There are many reasons for the slow pace of 5G development in these countries, including the lack of 5G spectrum and technology-neutral spectrum licensing (to allow the refarming of existing spectrum holdings), low levels of market readiness for 5G and a number of macro challenges, including insecurity and international conflicts, in several countries.

Given that 5G is a capital-intensive technology, it is essential for policymakers, operators and other ecosystem players to put in place the necessary building blocks for the efficient deployment of 5G networks and a sustainable business case ahead of commercial rollout. This includes ensuring the availability of adequate 5G spectrum and upgrading existing networks to prepare for future 5G rollout. Recent developments in some countries highlight that progress is being made:

- In October 2024, Egypt's National Telecommunications Regulatory Authority signed agreements for the second phase of 5G licensing with Vodafone, Orange and e&. This followed the award of a 5G licence to Telecom Egypt in the first phase of the process during January 2024.
- In September 2024, Tunisia's three main telecoms operators – Tunisie Telecom, Orange and Ooredoo – submitted bids for a 5G licence to the Ministry of Communication Technologies in response to a tender issued in June 2024.
- In September 2024, Türkiye received its first signal from a domestically produced 5G portable private network, marking a milestone in the country's ambition to establish a fully independent 5G infrastructure. The government plans to hold a 5G licence auction in 2025, with the first commercial service expected in January 2026.
- In January 2024, the telecoms regulator in Libya started looking into a roadmap for licensing of 5G services. Several scenarios are being considered, including awarding licences to existing state-owned operators only or to new players as well.

## 2.2

# Open Gateway: capturing the opportunities ahead

While it has long been possible to expose network APIs, operators have struggled to adopt a standardised approach that unlocks innovation at a global scale. This is the driving force behind the GSMA Open Gateway, which helps developers and cloud providers enhance and deploy services more quickly via single points of access to operator networks.

The GSMA Open Gateway is achieved via common, northbound service APIs that expose mobile operators' network capabilities within a consistent,

interoperable and federated framework. The APIs are defined, developed and published in CAMARA, the open-source project for developers to access enhanced network capabilities, driven by the Linux Foundation in collaboration with the GSMA.

The GSMA Open Gateway comprises a library of 17 APIs. These are split into different families based on the use case being addressed. The APIs have the potential to facilitate numerous use cases, including tackling digital fraud, simplifying user authentication and addressing QoS issues.

### Open Gateway gains traction

By the end of June 2024, 53 operator groups had signed up to the GSMA Open Gateway, representing 240 mobile networks and accounting for 67% of mobile connections globally. Between the participating operators all regions are covered, with Du, e&, Omantel, STC and Zain among the operators in MENA to sign up to the initiative.

The geographic breakdown of operator commitments indicates whether a particular region is above or below their established market share. Europe, for example, is the leading region, with committed operators representing a quarter of GSMA Open Gateway commitments despite accounting for only 10% of mobile connections. The share of operators in MENA committed to the GSMA Open Gateway is slightly below MENA's mobile market share of 8%, despite the region being a vibrant digital services marketplace. Further commitments are likely over the next 12 months, meaning that take-up should rise in regions that remain underpenetrated relative to expectations.

As in other regions, early GSMA Open Gateway launches in MENA have focused on fraud prevention and security, using APIs such as Device Status, One Time Password SMS and SIM Swap. These can represent quick wins, given the ever-present risks from fraudsters and breaches for operators and their customers. Other parts of the API library (e.g. Quality on Demand) will be deployed in the coming years as operators expand their rollouts of 5G SA and other enabling technologies.

**Early GSMA Open Gateway launches in MENA have focused on fraud prevention and security, using APIs such as Device Status, One Time Password SMS and SIM Swap**

Figure 13

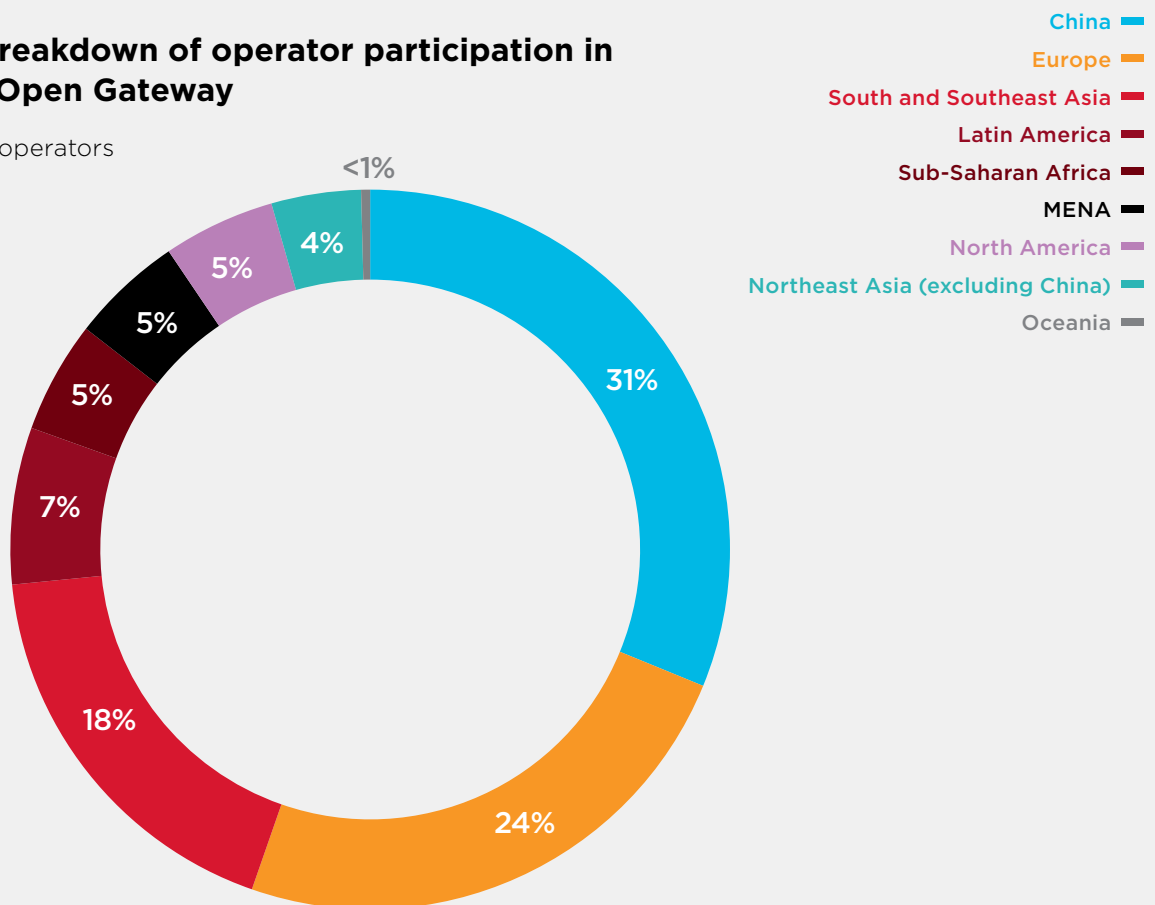
### Commercially launched GSMA Open Gateway APIs in MENA

API name	Description	Example use cases
<b>Device Status</b>	Checks the connectivity status of user equipment. In its current version, this API only checks the roaming status of a device	Fraud prevention in banking; regulatory compliance; service delivery (e.g. a content provider may need to enforce territory restrictions of their content)
<b>One Time Password SMS</b>	Delivers a short-lived one-time password to a mobile phone number via SMS	Account management (e.g. password reset); high-value transactions and onboarding for digital services (e.g. banking, social media)
<b>SIM Swap</b>	Obtains information on any recent SIM pairing change related to the user's account	Fraud prevention in banking; fraud prevention for password reset

Figure 14

### Regional breakdown of operator participation in the GSMA Open Gateway

Percentage of operators





## Visible markers of progress will be key to sustaining momentum

In the next 12 months there will likely be more operator commitments and market launches in MENA. Operators are also likely to increase their focus on the developer experience, dedicating internal resources to work directly with developers to grow API usage and capitalise on monetisation opportunities. e& is one operator with experience in this area, having worked with API aggregators to support local hackathons aimed at fostering innovation and enhancing the technical skills of young people in the region.<sup>5</sup> The operator has also launched a developer portal that provides free access to a suite of APIs in service management, customer management, product catalogue, billing and network exposure.<sup>6</sup>

In addition to strategies focused on direct engagement with developers, many operators will also likely collaborate with channel partners (companies that connect multiple operators to multiple developers) to reach a broader base of developers. Hyperscalers, communications platform-as-a-service suppliers and network infrastructure vendors are all vying to play this role in the GSMA Open Gateway ecosystem. As the number of partnerships between operators and channel partners grows, it will be important for these collaborations to yield concrete examples of how federation and agreement on common APIs can create new monetisation opportunities in order to sustain the momentum behind network APIs.

## 2.3

# Satellite: momentum builds behind aerial connectivity

Telecoms networks remain the primary form of connectivity, supported by the wide area coverage of wireless networks and the mass production and adoption of mobile devices. In recent years, however, technological advances in various satellite and other NTN, such as unmanned aerial vehicles (UAVs), have helped to overcome several limitations associated with aerial connectivity. This has resulted in significant performance improvements, lower deployment costs and more commercially viable business models for satellite and NTN-based connectivity solutions.

LEO satellite and HAPS providers have attracted much attention on the back of significant investments and technical breakthroughs that improve the business case for delivering connectivity at scale. A key selling point for aerial connectivity solutions is the potential to provide ubiquitous coverage all over the globe. Telecoms networks now cover more than 95% of the world's population but less than 45% of the world's landmass. Satellites and NTNs are well suited to

deliver connectivity in maritime, remote and polar areas, where deploying conventional terrestrial networks could be costly and challenging.

The 3GPP has laid the foundation for satellite-based connectivity through standardisation to extend the reach of 5G to regions lacking terrestrial infrastructure. Four broad use cases have been identified:

- **Service continuity:** For coverage where it is not feasible with terrestrial networks, such as maritime or remote areas.
- **Service ubiquity:** For mission-critical communications, such as for disaster relief during outage of terrestrial networks.
- **Service scalability:** For offloading traffic from terrestrial networks to NTNs for better system efficiency.
- **Backhaul services:** For transport for sites with weak or no backhaul capacity.

5. "FutureNow Hackathon With Manipal University, e& enterprise, and Vonage", Vonage, November 2022

6. "e& UAE adopts TM Forum and-Camara based Open APIs", e&, June 2024

## A new era of telco-satellite partnerships in MENA

The deserts and mountain ranges in several countries in MENA mean that aerial connectivity will play an important role in realising universal connectivity, especially for communities in remote and sparsely populated areas. As a result, there has historically been significant interest in aerial solutions and the opportunity they offer to help extend connectivity to hard-to-reach locations. The UAE has been at the forefront of the development of homegrown satellite communications companies in the region, notably Thuraya, which was acquired by another Emirati satellite company, Yahsat, in 2018. In 2020, Ooredoo partnered with Es'hailSat to deliver Inmarsat L-band satellite voice and data services to enhance business communications across Qatar and beyond.

The emergence of LEO and HAPS solutions have heightened the interest in satellites and NTNs, and ushered in a new era of collaboration between telecoms and satellite operators for solutions spanning several use cases, including remote area connectivity, disaster response and maritime services. Some examples of partnerships and other recent activities are highlighted below.

- In March 2024, **e&** signed a memorandum of understanding (MoU) with satellite operator Yahsat for its direct-to-device (D2D) solution that enables satellite connections for standard smartphones. Both companies will collaborate on initiatives around Yahsat's D2D ecosystem, dubbed Project Sky, which is designed to provide voice, SMS and data solutions for smartphones and IoT devices.
- In January 2024, **Du** announced a partnership with satellite operator Intelsat to provide coverage around the UAE. Du will combine its mobile backhaul solution with Intelsat's IS-39 geostationary satellite to extend services to remote areas. In January 2023, Du also used SES's satellite to conduct a proof-of-concept for satellite-enabled 5G backhaul.
- In October 2023, **STC** signed an agreement with Tonomus, Neom's digital infrastructure subsidiary, for access to LEO satellite capacity. The collaboration will enable the provision of high-speed internet access to residents of rural and remote areas across Saudi Arabia.
- In August 2023, **Zain Saudi Arabia** signed an MoU with AST SpaceMobile to collaborate on new telco-satellite solutions and digital services in Saudi Arabia, with the goal of increasing access to mobile services in remote locations, including on land, at sea and in flight.

The resurgence of D2D solutions follows technical breakthroughs that have enabled satellites to connect to standard smartphones for SMS, voice and data services. For operators, D2D services offer access to new customers in underserved areas and the capability to provide connectivity in remote areas. For satellite providers, operators' existing relationships with end users and, where relevant, existing spectrum holdings are crucial for satellite solutions to achieve scale. GSMA Intelligence estimates a total incremental revenue opportunity from D2D services of over \$30 billion for telecoms operators by 2035.

It is worth noting that the availability of compatible devices will contribute to the take-up of end-user satellite-enabled services, such as messaging and voice calling in emergency situations or areas without access to terrestrial networks. Unsurprisingly, major OEMs have stepped up investments and innovation into solutions to enable NTN-based connectivity. For example, in June 2024, Apple disclosed that it was expanding the capabilities of satellite messaging on the iPhone 14 and subsequent models by broadening the availability of the service beyond emergency messaging and making messages via satellite an option when cellular and Wi-Fi connections are not available. In February 2024, Qualcomm announced the introduction of the Snapdragon X80 5G modem, which would enhance the connectivity of smartphones and other devices to 5G and satellite networks.

## 2.4

# Generative AI: growing momentum in investment and use cases

Operators are increasingly embracing genAI across various operational and business areas, driving both internal transformation and new business opportunities. In the mobile industry, genAI is largely used to improve customer services as

well as for networks. In the MENA region, genAI adoption is gaining significant momentum, fuelled by major investments, strategic partnerships and cross-industry applications.

### A focus on data-driven decision-making

Operators are utilising AI to analyse vast amounts of data to enable better decision-making. By using insights from user behaviour, network performance and market trends, operators are optimising their services and resources more effectively. GenAI solutions are being leveraged to improve customer service through chatbots, virtual assistants and personalised marketing strategies. Furthermore, operators are using genAI to predict network issues, automate maintenance and enhance overall network performance.

The rise of genAI is supported by strategic partnerships aimed at enhancing infrastructure and developing diverse AI-driven use cases. Many telecoms operators in the MENA region are partnering with technology firms to access advanced AI capabilities. Collaborations with companies such as Microsoft and IBM are helping operators integrate AI into their operations, fuelling innovation. These partnerships are enhancing operators' AI capabilities, laying the foundation for new business models and revenue streams. Some recent examples include the following:

- **STC's 'Scan & Go SIM'**: STC introduced a self-activation 'Scan & Go SIM', which uses AI facial recognition. Customers can buy and activate the SIM within one minute via the My STC BH app, without visiting a branch. The service offers flexible prepaid and postpaid plans.
- **e& expands AI capabilities**: e& has expanded its collaboration with Oracle to enhance AI capabilities. The operator will deploy Nvidia H100 graphics processing unit (GPU) clusters within its Oracle Cloud Infrastructure (OCI) Dedicated Region, hosted at Etisalat by e& data centres. It aims to facilitate the localisation and development of new AI services for its product portfolio and business operations. The accelerated computing capabilities by Nvidia GPUs, combined with OCI's AI infrastructure featuring bare metal and remote direct memory access (RDMA) cluster networking, will provide e& with a diverse array of options for business services and AI training.
- **Turkcell's collaboration on AI research**: Turkcell and Huawei have signed three agreements on 5G-Advanced, green energies and AI-based networks. The companies will conduct research on 5G-Advanced technologies, including ambient IoT and RedCap, and will collaborate on the development of 5G-Advanced networks. Further, they will also start a joint innovation project to implement AI-based, user-centric and self-optimising networks.



## Investments in data centres

In addition to operational innovations, there are increasing investments in data centres to support genAI adoption across industries, especially in the GCC countries. For example, in 2024, e& expanded its SmartHub data centre network to Abu Dhabi, which plays a crucial role in the region's AI ecosystem by providing advanced services that facilitate AI research and development. Its Kalba data centre anchors the 2Africa cable landing, significantly enhancing connectivity and data transfer speeds essential for AI advancements. Similarly, in 2023, Du unveiled a new data centre to elevate Emirates NBD's IT infrastructure. This facility plays a critical role in supporting AI-driven financial services, enhancing data security and enabling sophisticated AI applications in the banking sector.

Despite the growing momentum for genAI, challenges remain, such as the shortage of skilled AI professionals. To support AI adoption and skills for the telecoms sector, the GSMA and IBM have together launched the GSMA Advance AI Training programme and the GSMA Foundry Generative AI challenge and programme, furthering genAI progress across the telecoms industry.



## 2.5

# Mobile financial services: supporting humanitarian assistance

Over the past decade, mobile money has expanded from a niche offering in selected markets to a mainstream financial service, bringing millions of households into a more inclusive digital economy. Where mobile penetration is high enough, mobile money and broader digital financial services can facilitate financial inclusion and the financial well-being of people in need of humanitarian assistance during crises. According to a GSMA survey on mobile money, nearly one third of operators partnered with humanitarian organisations in 2023 to offer essential services.<sup>7</sup>

In the MENA region, mobile operators are at the forefront of facilitating humanitarian relief through both connectivity and mobile financial services, such as mobile wallets and mobile money. In areas affected by conflict, displacement and economic instability, where traditional financial systems are often disrupted, mobile connectivity becomes a lifeline, enabling people to access vital digital financial services to avail aid.<sup>8</sup>

Mobile wallets provide a secure, efficient and transparent way to distribute humanitarian assistance. Through mobile networks, aid agencies and governments can send emergency cash transfers directly to refugees, internally displaced people and marginalised communities. These funds can be used for critical needs, including food, shelter and healthcare, ensuring that vulnerable populations receive immediate support, such as the following:

- In **Sudan**, mobile wallets such as MyCash and RittalPay, which don't require formal bank accounts, are more accessible to the unbanked population during crises.<sup>9</sup> Additionally, Zain Sudan and MTN have played a key role in supporting humanitarian efforts by offering mobile money services. Their platforms have allowed rapid and secure cash-based aid distribution to displaced people, even in remote conflict-affected areas.
- In **Palestine**, Jawwal Pay provides accessible and reliable e-payment services across Gaza and the West Bank. In 2024, the United Nations Development Programme partnered with Jawwal Pay and PalPay to implement innovative digital payment systems aimed at delivering fast, transparent and secure financial transactions for both banked and unbanked citizens, especially during emergency situations in Gaza. Moreover, Jawwal and Ooredoo expanded their mobile networks and mobile money services in the West Bank and Gaza. The expansion allowed aid agencies to transfer funds directly to affected families during periods of conflict. These mobile wallets enabled families to buy food and medicine in a region where banking services are often disrupted.

Mobile operators often collaborate with governments, non-governmental organisations and international organisations to expand their mobile money services. For example, operators in Egypt, Jordan and Lebanon have partnered with organisations such as the World Food Programme and the Office of the United Nations High Commissioner for Refugees to facilitate mobile-based cash transfers for refugees and vulnerable populations.

Operators are increasingly focused on enhancing their services to drive financial inclusion and resilience. In 2023, Ooredoo adopted Huawei's mobile money platform to enhance its mobile money services across MENA. By offering mobile money services alongside emergency relief efforts, operators not only address immediate needs but also promote long-term financial inclusion and resilience for vulnerable populations.

7. [The State of the Industry Report on Mobile Money](#), GSMA, 2024

8. [Digital Financial Services in Humanitarian Settings](#), GSMA, 2023

9. "Digital money apps become a lifeline for war-affected Sudanese", The New Humanitarian, February 2024



# 03

## Mobile industry impact



# 3.1

## Operators progress towards net-zero emissions

Mobile network operators globally are increasing their commitments to achieving net-zero carbon emissions, addressing both direct and indirect emissions across their value chains. Operators in MENA have seen a slight decrease (2%) in electricity usage from 2021 to 2022 but a

significant increase in the share of renewable electricity (up from 3% to 23%). This has led to a drop of 25% in both Scope 2 emissions overall and in Scope 1 and 2 emissions per connection, as per GSMA research.<sup>10</sup>

### Transition to renewables

The shift from fossil fuels to renewable energy sources is key for a zero-carbon business. Countries with few or no natural energy resources are more exposed to global fluctuations in energy prices, so local operators have every reason to be ambitious with renewables. Turkcell provides a strong example, having already committed to meeting its electricity demand from renewables by 2030. The operator announced plans in August 2023 to invest \$240 million in green energy projects.

Many parts of the MENA region enjoy abundant sunshine, making solar power a particularly promising option for network operators. They can deploy solar panels at their sites, storing excess electricity in batteries, or build large-scale solar farms.

For example, Orange has deployed three solar farms in Jordan, supplying around 70% of the electricity needs of its subsidiary in the country. In Egypt, the operator has converted hundreds of sites to work with hybrid energy by installing modern generators that reduce the use of diesel while also working on charging high-efficiency lithium batteries. This means, the number of conventional generators has decreased by more than 55%. Other MENA operators are also exploring hybrid solutions. Zain recently became the first operator in Bahrain to implement a renewable power source at one its sites, using a hybrid solution combining generators, batteries and solar panels. The solution reduces CO<sub>2</sub> emissions by more than 15%.

### Technology for energy savings

In addition to adopting renewable energy, operators in MENA are increasingly leveraging AI/ML and IoT to drive energy savings, such as the below examples:

- **AI/ML for RAN energy savings:** Umniah Jordan has partnered with Ericsson to deploy AI/ML solutions to cut energy use in its network. The deployment comes after a successful proof-of-concept, where Ericsson's intelligent RAN power-saving solution demonstrated a roughly 20% reduction in energy use on 5G daily power-saving capabilities. The solution uses ML to analyse real-time data, making intelligent decisions to optimise energy use, which lowers carbon emissions and operating costs.

- **IoT energy platform:** Orange has launched its IoT platform, Orange Smart Energies, for energy suppliers in Africa and the Middle East. The platform tracks payments, solar kits and smart meters in rural areas to improve service uptake and electricity access. Payments are processed through Orange's mobile finance platform, Orange Money.

10. [Mobile Net Zero: State of the Industry on Climate Action 2023](#), GSMA, 2023



## 3.2

# The mobile industry's impact on the SDGs

The mobile industry continues to achieve its impact on the Sustainable Development Goals (SDGs), driven by the increased reach of mobile networks and growing adoption of mobile internet services. SDG 1: No Poverty, SDG 4: Quality Education and SDG 16: Peace, Justice and Strong Institutions are

the most improved SDGs in the MENA region. The increasing migration to mobile broadband services is supporting the mobile industry's contribution to the SDGs.

Figure 13

### Mobile's impact on the SDGs in MENA



Source: GSMA Intelligence



## Driving growth of SMEs and digital inclusion

Mobile technologies have played a key role in advancing SDG 1: No Poverty, having reached 2.1 billion of the world's poorest people. Among these, nearly half are now connected to mobile internet – an increase of 770 million since 2015.<sup>11</sup> As a general-purpose technology, mobile drives sustainable economic growth, boosts productivity and enhances efficiency across the wider economy. It supports small and medium-sized enterprises (SMEs) by enabling them to reach new markets beyond their local areas, creating jobs and contributing to local economic development. In the MENA region, mobile operators are fostering SME growth through partnerships that provide access to essential technologies and digital tools. Examples of key initiatives include the following:

- **e& supports SMEs:** In June 2024, The Abu Dhabi Chamber of Commerce and Industry signed a deal with e&, aimed at boosting cooperation to back SMEs in Abu Dhabi. The partnership aims to enhance the business community by deploying advanced communication solutions and digital services. The Chamber will leverage e& UAE's expertise in digital technologies to facilitate digital transformation processes for SMEs in Abu Dhabi, while e& will provide customised solutions in cloud computing, digital marketing, cybersecurity and innovative payment solutions.

These features will boost commercial operations, enhance efficiency and improve customer experience for SMEs.

- **Orange offers technology access:** In early 2024, Orange Middle East and Africa (OMEA) signed an agreement with Microsoft to support 15,000 SMEs across 17 countries, with a long-term goal of reaching 1 million over time. The initiative will provide SMEs, including micro-businesses and those in the education sector, with access to tools and support to accelerate digital adoption. The initiative focuses on three areas. First, Orange's distribution network in the Middle East and Africa region will provide SMEs with easy access to Microsoft solutions such as Microsoft 365, Copilot, Azure and Dynamics 365. Second, Orange and Microsoft will collaborate on training, marketing and sales support programmes to enable SMEs to adopt and benefit from Microsoft Modern Work solutions. Finally, the two will establish a joint steering committee to ensure the successful execution of the partnership, with progress monitored through key performance indicators.

11. [2024 Mobile Industry Impact Report: Sustainable Development Goals](#), GSMA



## Building inclusive societies through awareness and education

Mobile operators are also contributing to SDG 4: Quality Education and SDG 16: Peace, Justice and Strong Institutions by promoting inclusivity and providing access to quality education. SDG 4 aims to ensure equitable education and lifelong learning opportunities for all, while SDG 16 focuses on access to information and stronger institutions. By leveraging connectivity and digital solutions, mobile operators are enhancing educational access and fostering stronger, more informed communities. Some recent operator-led initiatives are listed below:

- **e& promotes inclusivity for visually impaired individuals:** e&'s Basira project, in collaboration with Dialogue in The Dark, was developed to raise awareness and promote inclusivity for individuals with visual impairments, both within the company and the wider community. The project aimed to foster empathy and combat discrimination, particularly among school-aged children, through an immersive experience. Participants were guided through everyday tasks in complete darkness for an hour, allowing them to experience the world as visually impaired individuals do. This was designed to build understanding and inspire employees to integrate accessibility into their work.

**By leveraging connectivity and digital solutions, mobile operators are enhancing educational access and fostering stronger, more informed communities**

- **STC empowers older people to safely navigate the digital world:** To address the growing digital literacy gap between older and younger generations, STC launched the SmartTruck initiative in Saudi Arabia in 2023 – a mobile digital classroom equipped with advanced ICT tools. The smart truck travels across Saudi Arabia to target remote areas and deliver digital education directly to those in need. The initiative offers awareness sessions for six key government applications, including health apps, helping attendees navigate these platforms and complete online tasks with ease. The programme also educates participants about potential risks in the digital world and equips them with the knowledge to mitigate these risks. The initiative has benefited over 4,150 adults, providing them with essential digital literacy skills.
- **Zain Omantel International joins One Consortium to combat fraud:** Zain Omantel International (ZOI) joined forces with One Consortium, a not-for-profit organisation dedicated to combatting illegal and unwanted international voice calls and messages. Working alongside global telecoms operators and regulators, One Consortium aims to tackle the growing issue of telecoms fraud, which poses significant risks to both consumers and businesses. According to the Hiya Global Call Threat Report, 7.3 billion suspected spam calls were recorded in Q4 2023, an alarming increase from 6.55 billion in Q3 2023. As a voting member of One Consortium, ZOI will contribute to working groups on key issues such as fraud detection, regulatory policy, messaging fraud, international traceback and caller ID spoofing.



# 04

## Mobile industry enablers



The mobile industry in MENA has shown resilience in the face of myriad macroeconomic challenges, such as hyperinflation and international conflicts. At the same time, operators have remained committed to investing in high-performance networks, including 5G, to support the digitalisation agenda of governments in the region and meet the growing demand for enhanced

connectivity, despite slowing revenue growth rates and tightening margins. This scenario of slowing revenue growth and rising costs undermines the long-term financial sustainability of the mobile industry in the region. In this context, policymakers in the region have a role to play to sustain the continued advancement of the mobile industry.

## 4.1

# Measures to ensure industry sustainability

The challenges faced by the mobile industry are multi-faceted. While there is no one-sized-fits-all approach to tackling these challenges, there are

pertinent issues that require urgent attention from policymakers in the region, some of which are highlighted below.

### Investment gap

Across MENA, the rollout of 5G is driving an increase in data traffic. However, the ability of operators to expand network capacity and coverage is often hindered by regulatory constraints, market structures and excessive tax burdens. This has created an 'investment gap', whereby market conditions for private investment in telecoms networks are not favourable enough

to meet ambitious national and regional digital policy targets. European authorities are currently gauging the 'fair share' proposal to help close the investment gap. Meanwhile, in South Korea, regulatory pressure has led to commercial agreements on contributions to network costs between a large traffic generator and a telecoms operator.

### Taxation

Faced with fiscal challenges, some governments in MENA have mobilised resources locally through increased taxation to meet their development objectives. As a result, the sector is taxed disproportionately higher than others, despite its positive externalities across various sectors. These include increased value from agricultural resources, improved access to global value chains, enhancements to education and healthcare provision, reductions in transaction costs for economic and public service activities, improved efficiency of government services, transparency and good governance. Additionally, sector-specific taxes increase the cost of broadband access and usage, making digital devices and services less accessible, lowering economic growth.

The mobile sector is committed to paying taxes in the countries where it operates to support the government's development objectives. However, the industry calls for more structured taxation regimes that do not impact the affordability of services to consumers and investment in the industry. To this end, policymakers should eliminate or decrease industry-specific excise taxes applied to mobile services, and remove sector-specific taxes/fees on mobile operators, particularly those imposed on operators' revenues irrespective of profitability, to ensure fair treatment of the sector and encourage investment in mobile infrastructure.

## QoS regulations

QoS is increasingly important in mobile communications, with consumer digital services now fundamental for many facets of life and access to the latest digital solutions a key competitiveness driver for businesses. There is a broad stakeholder interest (including from governments and policymakers, industry players and consumer groups) in maintaining high levels of mobile QoS. However, a recent GSMA Intelligence study on QoS in Asia Pacific found that where QoS obligations are introduced, they generally have no discernible effects on QoS. If anything, they can impose significant compliance costs on mobile operators and heighten the risk of unintended consequences, for example that resources destined to invest in coverage are reallocated to meet QoS requirements.

## Infrastructure sharing

With the adoption of 5G, mobile data traffic is expected to grow threefold in MENA between 2023 and 2030. Operators will have to increase their number of sites, particularly in urban areas, to cope with rising data demand. Moreover, the growing popularity of 5G FWA in countries such as Oman and Saudi Arabia adds further impetus to densifying mobile networks. Even in areas where network densification is not required, existing sites must be upgraded to cope with rising data traffic levels. For example, massive multiple-input multiple-output (MIMO) antennas will be needed to optimise 5G capacity and throughput.

One policy measure that has helped to reduce the prices of telecoms services is the sharing of infrastructure. Recommendation ITU-T D.264 proposes a set of possible methods to help telecommunications providers save costs and enhance efficiency through the shared use of the telecommunications infrastructure, including passive and active infrastructure sharing.

Meanwhile, QoS is the result of a complex and multidimensional reality that places significant direct responsibility on governments, the mobile ecosystem (mobile operators, device makers and digital platforms) and consumers. This highlights the need to move towards a collaborative framework across these agents that delivers real QoS progress – one that protects the interest of consumers, promotes fair competition and choice and encourages investments in network infrastructure and services. Alternative approaches such as consumer-focused regulations and co-regulations can often offer a better balance by delivering on policy objectives while minimising compliance costs.

The Recommendation indicates that there is a potential saving of up to 30% with passive infrastructure sharing and up to 50–60% for active infrastructure sharing.

The network investment required to roll out 5G is driving operators to reconsider their approaches to mobile tower ownership. In recent years there has been a wave of activity among mobile operators, tower companies and investment funds. For operators, tower divestments boost liquidity and free up cash to invest in other parts of the business. Recognising this opportunity, there is a need for policymakers to encourage and expedite approvals for voluntary infrastructure sharing to ease the burden of network expansion and maintenance costs on operators.

## 4.2

# Policies for growth: importance of harmonised mobile spectrum

### The importance of harmonised mobile spectrum

Spectrum harmonisation continues to play a key role in the success of mobile networks. As spectrum is a scarce resource, ensuring the timely availability of prime bands should be a priority. 2 GHz of mid-band spectrum (1-7 GHz) will be required per market, on average, by 2030 to ensure the 5G requirements of speed and quality of mobile. Mid-bands deliver citywide capacity, and sufficient capacity is important for minimising network densification, keeping down both costs and carbon emissions. The 3.5 GHz band represents the birthplace of 5G. Reusing 4G bands and extending the 3.5 GHz range are important steps as countries look to expand mid-band capacity, but adding new bands (such as the 6 GHz band) is also important.

Decisions achieved at WRC-23 will have a major impact on the future of mid-band spectrum. Final harmonisation of the 3.5 GHz band (3.3-3.8 GHz) - the pioneer 5G band - was achieved across Europe, EMEA and the Americas. This step will allow more countries to take advantage of economies of scale in the mobile ecosystem and benefit from higher speeds provided by wide spectrum channels in this range.

WRC-23 also identified 6 GHz (6.425-7.125 GHz) for mobile use by countries in every region - EMEA, CIS, the Americas and Asia Pacific - and global, harmonised conditions for its use have been agreed in the ITU's Radio Regulations.

The identification brings together billions of people into a harmonised 6 GHz mobile footprint. It also serves as a critical developmental trigger for manufacturers of the 6 GHz equipment ecosystem.

Discussions regarding the future of 6 GHz should focus on maximising its value and balancing different uses. The outlook for the 6 GHz IMT ecosystem is robust and there are also no technical barriers to developing and commercialising IMT solutions. Trials by mobile operators around the world are underscoring this.

More low-band spectrum (below 1 GHz), which supports coverage in wide and rural areas, will also play an important role for future expansion and can help 5G deliver digital equality. Adding 600 MHz to the low-band portfolio can bring further economic growth to remote locations and drive higher speeds in rural areas, lowering the divide between urban and rural areas. Some pioneering countries have started the development of 600 MHz, and following WRC-23 there is an opportunity for the MENA region to lead this development.

By 2030, an average of 5 GHz of high-band spectrum (mmWave) per market will also be needed to satisfy demand for different 5G use cases, including enhanced mobile broadband eMBB, FWA and enterprise networks.

**More low-band spectrum (below 1 GHz), which supports coverage in wide and rural areas, will play an important role for future expansion and can help 5G deliver digital equality**

## Spectrum licensing priorities

Spectrum licensing is important for mobile broadband development. The longer the duration of a licence, the greater the certainty provided to operators and investors to commit to large long-term network projects. Putting a presumption of licence renewal in place, or using indefinite licence terms, also helps avoid investments being delayed due to uncertainty about the future. A decision not to automatically renew a licence should only be made where there is a reasonable prospect that the benefits from reassigning spectrum would exceed the costs.

## Fair spectrum prices

Recent studies have demonstrated that higher spectrum prices can slow the rollout of next-generation mobile networks and reduce the network quality experienced by consumers. They can also be associated with higher retail prices in developing countries. Best practice in this area shows that regulators should aim to:

- assign spectrum to users who will be able to extract the most value from this scarce and finite resource for the benefit of society as a whole
- set reserve prices conservatively to allow the market to determine a fair price and to reduce the risk of leaving spectrum unassigned
- limit ongoing charges to recovering the cost of spectrum management, following auctions.

## Technology-neutral spectrum licences

A technology-neutral spectrum licensing approach enables the efficient use of spectrum by mobile operators, as then it is not tied to existing technologies and services. An important development has been the ability to 'gracefully refarm' bands so that they are used for several

For licences approaching the end of their current terms, timely renewal decisions (ideally three to five years in advance of licence expiry) would help facilitate ongoing network investments and enable planning that ensures service continuity for end users. Any subsequent fees associated with licensing renewals should not prevent reasonable returns being earned on risky investments, as this discourages technological innovation.

To accelerate 5G network investment, short-term monetary gains from spectrum awards should no longer be a measure of success. Policymakers may want to consider shifts in award designs to reflect wider economic goals, such as assigning spectrum with no upfront fees in return for coverage (as has been the case in Tunisia, Jordan, Qatar and the UAE).

technologies simultaneously, including 4G and 5G. This facilitates the introduction of newer technologies in line with increasing mobile broadband demand while also supporting legacy users. For regulators, this means fewer concerns that refarming will leave legacy users unserved.



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