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Ericsson Mobility Report

Middle East and Africa

February 2019

Middle East and Africa in focus

The Middle East and Africa region covers over 70 countries, a population of 1.6 billion and over 200 telecom operators.

Key figures for Middle East and Africa	2017	2018	Forecast 2024	CAGR 2018–2024
Mobile subscriptions (million)				
Middle East and Africa	1,420	1,470	1,820	4%
– Sub-Saharan Africa	680	710	940	5%
Smartphone subscriptions (million)				
Middle East and Africa	570	660	1,270	12%
– Sub-Saharan Africa	280	340	690	13%
Data traffic per smartphone (GB/month)				
Middle East and Africa	2.0	2.9	15	32%
– Sub-Saharan Africa	1.4	1.8	9.0	31%
Total mobile data traffic (EB/month)				
Middle East and Africa	1.1	1.8	15.4	43%
– Sub-Saharan Africa	0.4	0.5	5.2	46%
Mobile broadband subscriptions (million)				
Middle East and Africa	720	860	1,630	11%
– Sub-Saharan Africa	340	410	820	12%
LTE subscriptions (million)				
Middle East and Africa	160	230	780	23%
– Sub-Saharan Africa	30	50	310	36%

Economic recovery to drive investment in ICT

Economies in the Middle East and North Africa have shown signs of recovery in 2018 and are expected to grow by 3.9 percent in 2019 as oil exporters benefit from the improved outlook for oil prices.

In Sub-Saharan Africa, gross domestic product (GDP) growth is expected to show a similar upward trend, supported by rising commodity prices and improvement of the investment environment in large economies such as Nigeria and South Africa.

Continued economic growth in the region, coupled with a young population, favorable policies and lower cost devices, will drive investment in the telecoms sector, increasing uptake of ICT services.

Characteristics of markets in the Middle East and Africa

Advanced

- Wealthy and urbanized with very high Human Development Index (HDI) (average of 0.8).¹
- 8 percent of the market.
- Mobile broadband penetration over 100 percent in most countries.
- High data consumption driven by video.
- The telecom market is characterized by increasing uptake of LTE and there is a high usage of apps.
- Exploration of future 5G opportunities, with the introduction of 5G within 2019.

Optimizers

- High to medium HDI (average of 0.7).
- 26 percent of the market.
- Medium mobile broadband penetration (average of 40 percent).
- Significant growth is expected in data consumption together with large mobile broadband subscription increase.

Emerging

- Low HDI (average of 0.46) with low mobile broadband penetration.
- 66 percent of the market.
- Most subscriptions are currently WCDMA/HSPA, though there is still a relatively large base of GSM/EDGE-only subscriptions.
- Fewest LTE connections (less than 20 percent of total), but forecast to show the highest growth rate, at 25 percent annually between 2018 and 2024.

¹ The Human Development Index (HDI) is a statistical composite used to rank countries by average achievements in health, education and income

5G on the rise

In the Middle East and Africa 5G is forecast to reach 30 million subscriptions by 2024.

The majority of subscriptions in the Middle East and Africa will be WCDMA/HSPA and LTE in 2024

At the end of 2018, WCDMA/HSPA connections represented almost half of all subscriptions in the Middle East and Africa, rising only slightly until 2024. On the other hand, GSM/EDGE subscriptions are expected to decrease significantly from 41 percent of the total subscriptions in 2018 to 10 percent in 2024.

LTE subscriptions are forecast to have the highest growth at 23 percent Compound Annual Growth Rate (CAGR) between 2018 and 2024, driven by increased mobile communications service provider investment in 4G networks, as well as rising usage of data-intensive mobile services in the region.

Around 30 million 5G subscriptions are forecast in 2024, representing 2 percent of total mobile subscriptions.

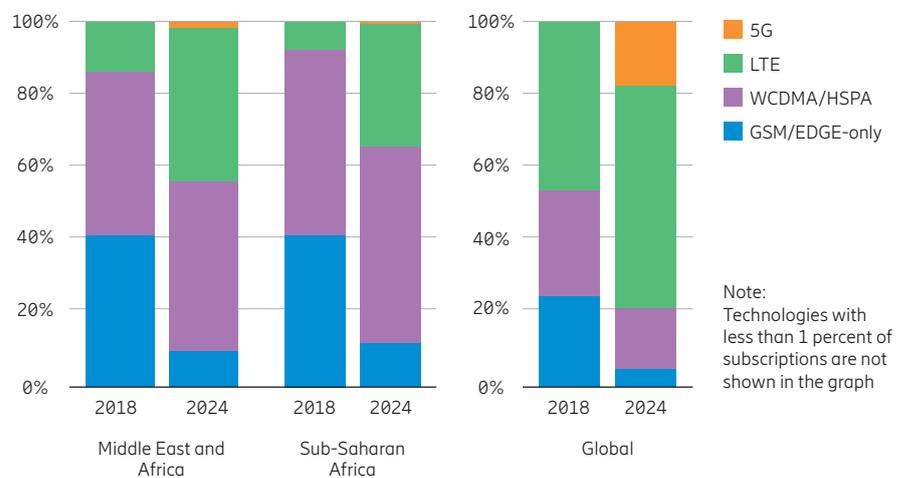
Highest growth in Sub-Saharan Africa is forecast to be in LTE subscriptions

Sub-Saharan Africa is expected to see stronger growth in LTE subscriptions at 34 percent between 2018 and 2024, though GSM/EDGE subscriptions will still be relevant, comprising 13 percent of the total subscriptions in 2024.

The increase in smartphone penetration will continue to drive service providers' investment towards mobile broadband technologies, as well as WCDMA/HSPA and LTE networks. High urbanization rates in the Middle East and increasing urbanization in Africa are encouraging service providers to migrate previous GSM/EDGE-only connections to WCDMA/HSPA and LTE. Rural network expansion also remains high on the service provider agenda, especially in Sub-Saharan Africa.

In 2018, several 5G trials commenced in the Middle East, while spectrum challenges continue to be discussed among regulators.

Total mobile subscriptions in the Middle East and Africa (percent)

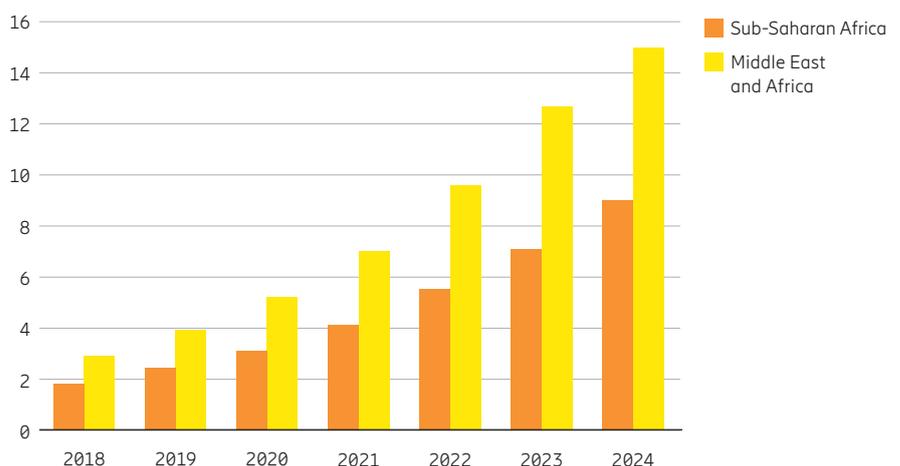


The demand for high-speed networks

The rise in WCDMA/HSPA and LTE network subscriptions in the Middle East and Africa continues to drive up data traffic in mobile networks, with total growth forecast at a CAGR of 43 percent between 2018 and 2024.

The combination of more consumption, increasing usage of mobile video applications on higher-resolution screens, and better network throughputs is forecast to lead to a rise in the data traffic per active smartphone from 2.9GB per month in 2018 to 15GB per month in 2024, a CAGR of around 30 percent.

Data traffic per active smartphone (GB/m)



Allocating service providers' spectrum assets for profitable growth

As networks mature and ecosystems evolve, service providers need to become increasingly agile in asset allocation to achieve the goal of profitable growth.

With the proliferation of ever more bandwidth-hungry apps such as HD and UHD video, virtual reality (VR) and augmented reality (AR), users will consume more data and demand a better experience. It is therefore of the utmost importance for their "spectrum" service providers to decide where their most valuable assets should be allocated, to achieve a balance between delivering experience to consumers while still making a reasonable return on their investment.

Spectrum efficiency and asset allocation: Migration assets from GSM "Old G"

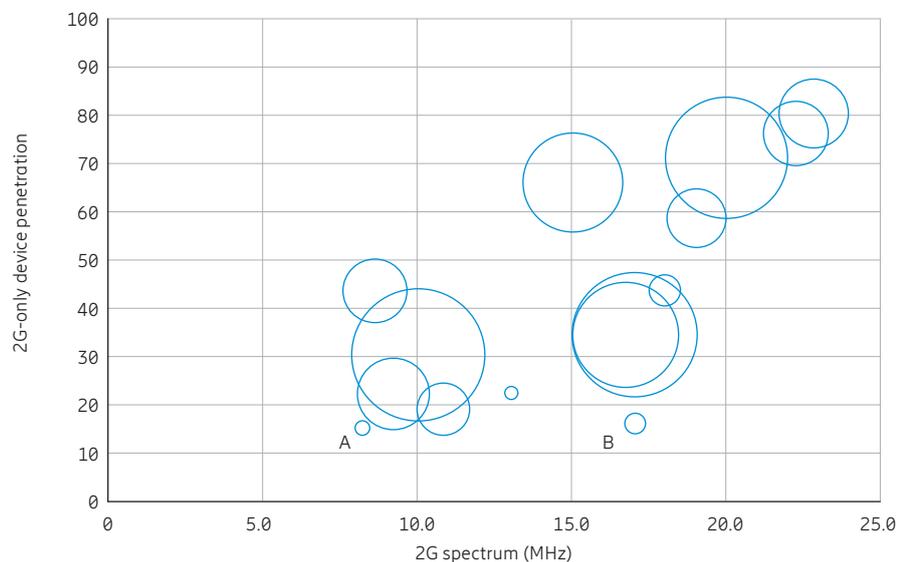
Spectrum is one of operators' most valuable assets. It is currently split between three co-existing technologies, namely GSM, WCDMA and LTE. Based on extensive regional network studies, it is clear much of the spectrum is still allocated to GSM and, to a certain extent, WCDMA. One of the leading arguments for keeping spectrum in GSM is the legacy of 2G devices still in the network.

The graph above shows a benchmark of operators' spectrum allocation to GSM versus 2G-only device penetration. For the same device penetration, considerable variation is seen among service providers in terms of allocated 2G spectrum. Operators A and B have less than 20 percent 2G-only device penetration, yet Operator B allocated almost double the spectrum asset to their 2G network. It is clear some service providers have successfully migrated significant chunks of GSM spectrum for more efficient use in WCDMA or LTE.

As can be seen in the 2G spectrum efficiency chart below, apart from some leading service providers, most are under-utilizing spectrum in GSM. This makes the case for aggressive migration of spectrum from GSM "Old G" to WCDMA and LTE "Higher G" more plausible.

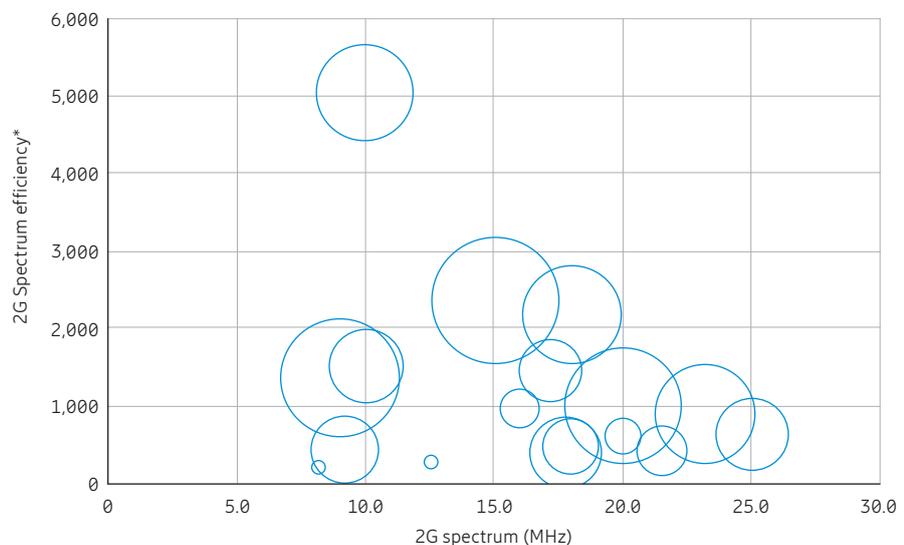
Benchmarking spectrum allocation by operators

○ Operator voice traffic. Circles indicate operators. Circle sizes represent voice traffic volumes.



2G spectrum efficiency among operators

○ Operator voice traffic. Circles indicate operators. Circle sizes represent voice traffic volumes.



* 2G Spectrum efficiency = 2G Erlangs / (2G sites x 2G spectrum)

Source: Based on Ericsson studies on different MEA service providers

Migration to new technology

Service providers can be more efficient today by sunsetting and migrating their spectrum bands to LTE.

Low band vs. high band

GSM technology operates on two main bands: low band (900MHz) and high band (1800MHz). The majority of service providers have migrated GSM bands to new technology: 900MHz to WCDMA and 1800MHz to LTE. In markets with mature device ecosystems, service providers should consider leapfrogging WCDMA and migrating to LTE for both bands. With the coverage advantage of these bands for LTE, service providers can achieve site deployment savings, where low band can act as a coverage layer whilst using existing high band as a capacity layer.

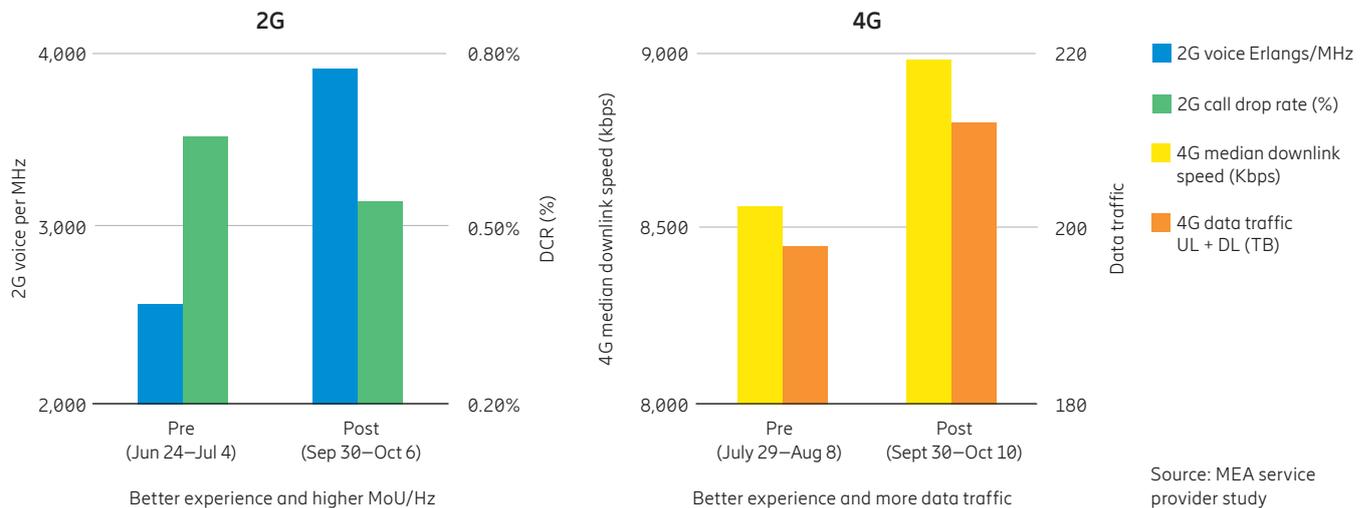
Sunsetting GSM 1800 or GSM 900

The next step service providers may consider is sunsetting one of the GSM bands and full migration of spectrum to LTE. Deciding which layer to keep depends on the existing GSM 1800 site density and 2G device penetration. Service providers with very good continuous 1800MHz coverage may sunset GSM 900 and allocate that spectrum to LTE.

Spectrum re-farming

The graph below shows a case where a significant amount of spectrum was re-farmed from 2G. This resulted in doubling the Minutes of Use per unit of spectrum (i.e. efficiency) with flat or slightly improved 2G performance. The impact on LTE was greater, with better performance and traffic (i.e. more revenue).

Spectrum migration impact



The enablers

In order to effectively and efficiently redeploy spectrum, it is recommended to use a thin layer GSM, where only a minimum amount of spectrum is kept for GSM.

Smart network planning

By analyzing charging data records, service providers can make decisions regarding deployment of sites and technology layers to maximize usage and ROI.

Data analytics and optimization

By using analytics, service providers can maintain optimized networks that are responsive to changes in traffic patterns, user behavior and the ecosystem.

Software features

By optimizing software features, service providers can make the most of existing hardware and maximize efficiency.

The road to 5G and challenges ahead

The introduction of 5G will have a considerable impact on the Middle East and Africa economy.

Data traffic and mobile broadband subscriptions

The Middle East and Africa region has a unique position globally: While it has countries on the cusp of 5G rollout, there are other parts of the region where the deployment of 3G and 4G is still in its infancy. The region is forecast to see the highest mobile data growth globally, increasing by nearly nine times from 1.8 to 15.4 EB/month from 2018 to 2024. Mobile broadband subscriptions are predicted to almost double from 860 in 2018 to 1,630 million in 2024.

5G status

First commercial 5G deployments by leading service providers are expected by early 2019, and significant volumes in 2021. It is estimated that by 2024 there will be around 30 million 5G subscriptions in the Middle East and Africa (see figure below).

The majority of the 5G subscriptions in the Middle East and Africa are expected to come from advanced ICT markets like the GCC countries Saudi Arabia, UAE and Qatar, while in Africa, considerable momentum is building in South Africa.

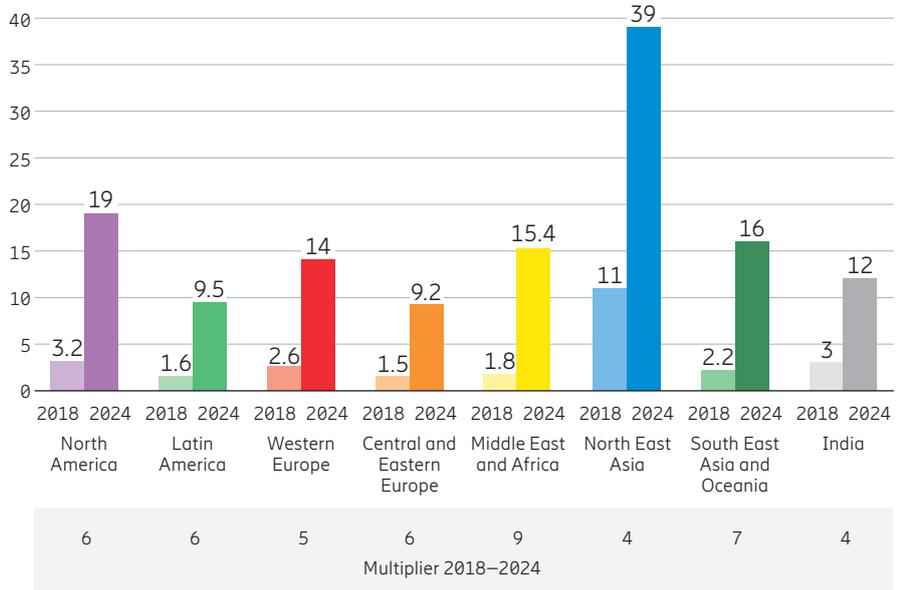
5G business opportunities

5G promises numerous opportunities besides enhanced mobile broadband, such as:

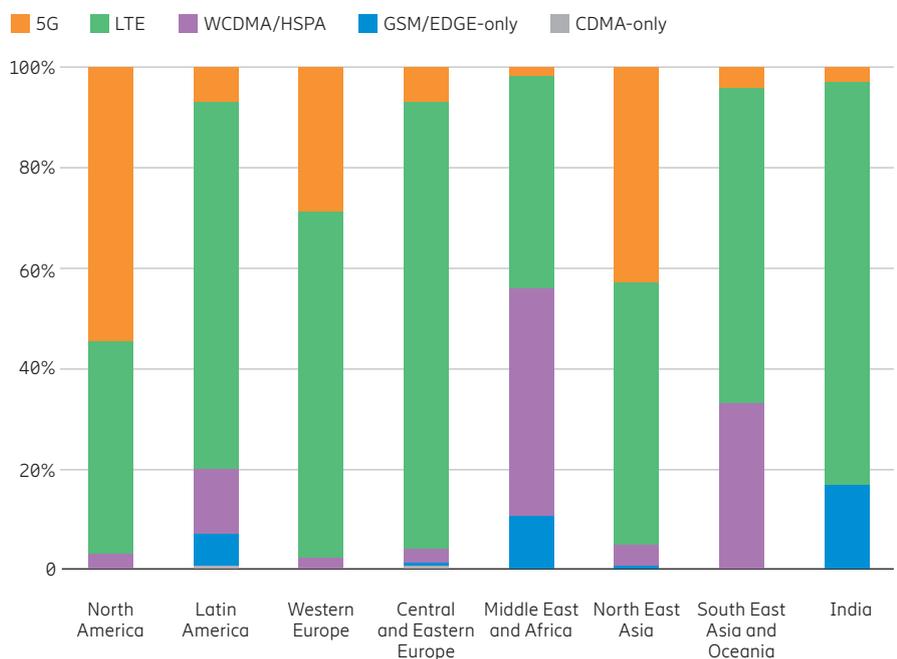
- Fixed wireless access (FWA)
- VR, AR and advanced media services
- Safety and security
- Industrial automation

The first wave of 5G introduction in the Middle East and Africa targets the FWA segment where operators utilize it as an alternative to fiber, with quick time to market, as well as being an additional revenue stream. Mobile service providers need considerable support from regulators to carve out enough spectrum in existing mid and low bands. High band and mmWave spectrum is needed for addressing ultra-low latency cases like automation, AR and remote monitoring.

Regional mobile data traffic (EB per month)



Regional subscriptions per technology (2024)



Connectivity and opportunities for the Internet of Things

The region has benefited from solid growth in cellular connectivity.

Cellular connectivity for IoT devices has been available for over 10 years since the days of 2G and 3G. For this type of connectivity the limitations were available network bandwidth and IoT device battery life. Addressing these challenges fostered growth of other non-cellular connectivity solutions: Better battery life and lower connectivity costs. Still, new concerns emerged, including coverage problems in cities, cross-border use, and most importantly a lack of secure connectivity for critical infrastructure services, such as utility, transportation and industrial use cases.

In the Middle East and Africa region, 4G networks grew rapidly since 2012, and so IoT use cases evolved to include fleet management, asset tracking of goods, and safe-city use cases.

Cellular connectivity using both 2G and LTE became the dominant solution for IoT because it solved coverage problems in cities and nations, roaming across borders, and ensured secure end-to-end connectivity. From the chart below we see that cellular connectivity experienced high growth in 2014, 2015 and 2016.

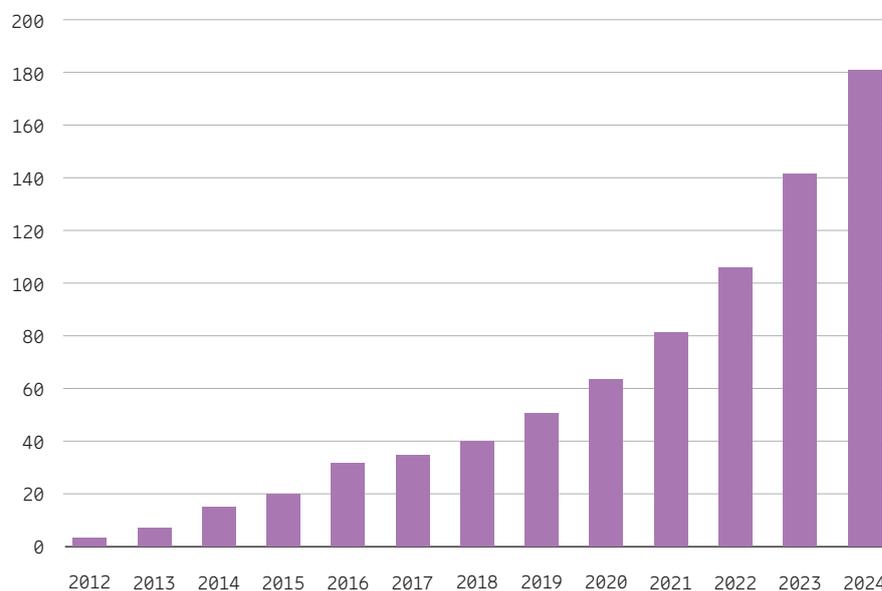
The limitations for 4G were IoT device cost, battery life and cost of connectivity. This led to the introduction of NB-IoT and Cat-M1 technologies which provided:

- Power efficiency for IoT devices: This addressed the potential problem of having to change the batteries on massive numbers of IoT devices every few months.
- Cost-saving: This has been achieved through cheaper chipsets and the low bandwidth (20–100Kbps) that they provide.
- Reliability: Cellular networks run on licensed spectrum and security with telecom-grade standards.

3.5x

The availability of cellular connectivity increased by over 3.5 times in the region between 2019 and 2024.

Middle East and Africa cellular IoT (million)



Ericsson enables communications service providers to capture the full value of connectivity. The company's portfolio spans Networks, Digital Services, Managed Services, and Emerging Business and is designed to help our customers go digital, increase efficiency and find new revenue streams. Ericsson's investments in innovation have delivered the benefits of telephony and mobile broadband to billions of people around the world. The Ericsson stock is listed on Nasdaq Stockholm and on Nasdaq New York.

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