Middle East & Africa Broadband Index Report

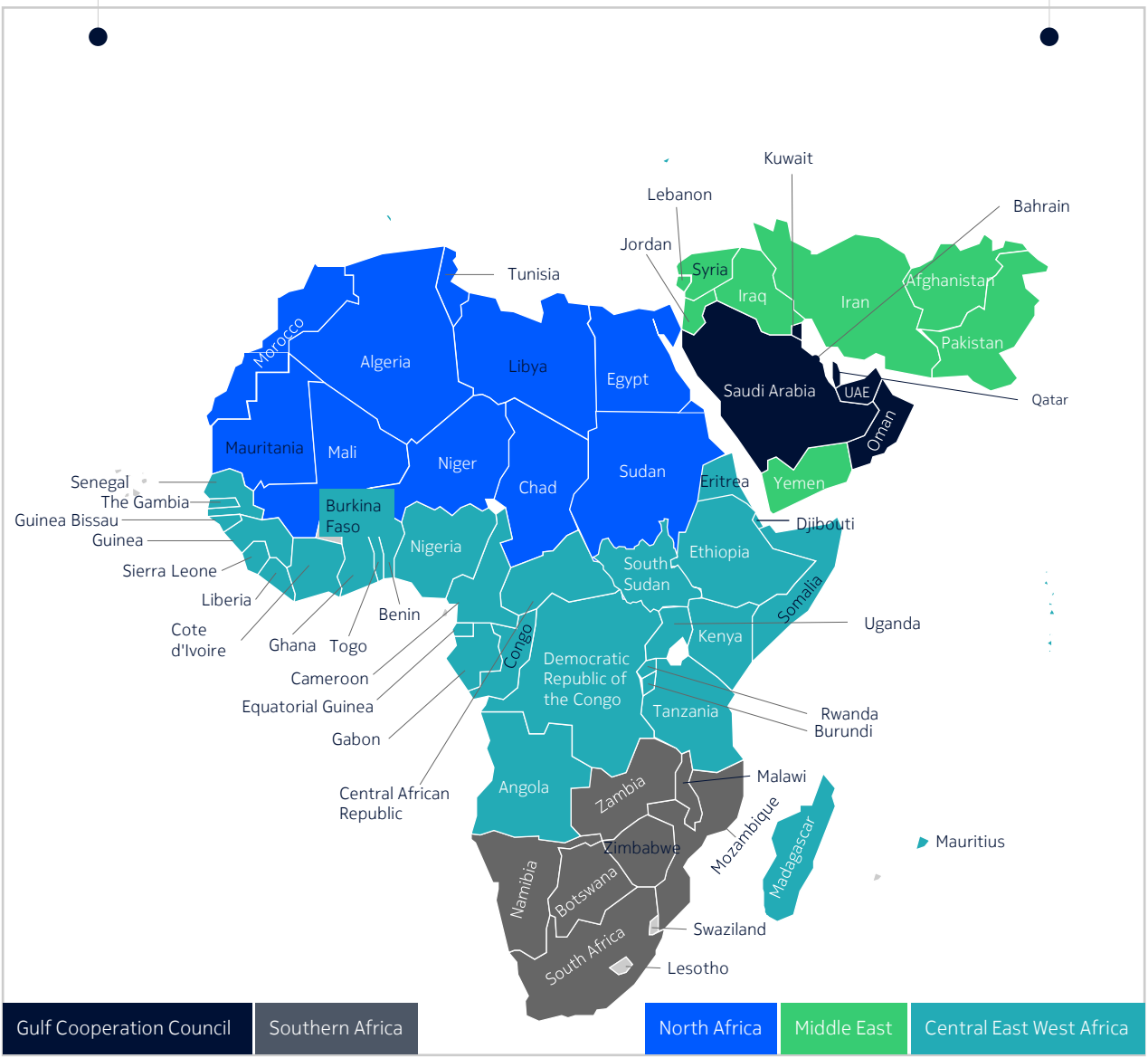
May 2023

About the report

Nokia's Middle East and Africa (MEA) Broadband Index report aims to provide valuable insight, data, and analysis on mobile broadband subscribers, coverage, ARPU, and traffic growth in the MEA region as well its respective sub-regions (Southern Africa, North Africa, Middle East, Central East West Africa and Gulf Corporation Council (GCC).

The report has been created based on Nokia's Intelligence and using data from various 3rd party sources. It analyses mobile broadband traffic trends only at a consolidated level and does not intend to provide a comparative analysis of data growth for different operators.

Few countries have been excluded from the research due to lack of available data.



Middle East and Africa: At a glance

Subscribers

1,698 mn

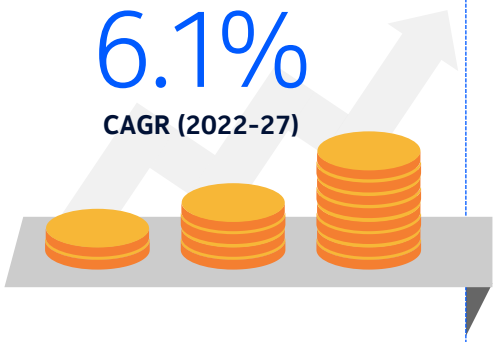
Subscribers in 2022

2,287 mn

Subscribers in 2027

6.1%

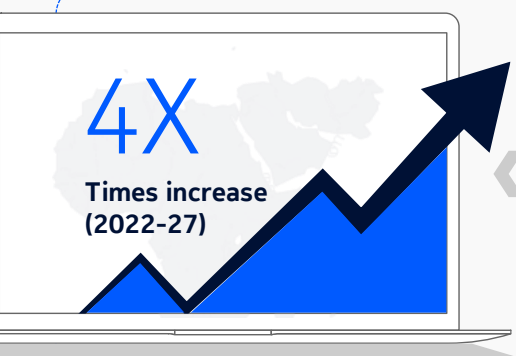
CAGR (2022-27)



Data traffic

4X

Times increase (2022-27)



351,890 PB

Data traffic in 2027

87,361 PB

Data traffic in 2022

Revenue

US$76.8 bn

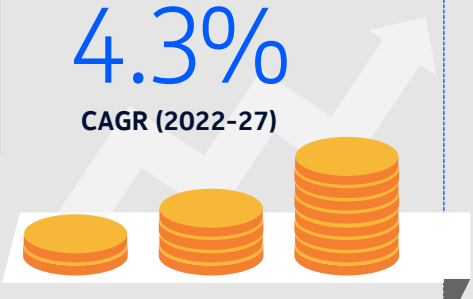
Revenue in 2022

US$94.7 bn

Revenue in 2027

4.3%

CAGR (2022-27)



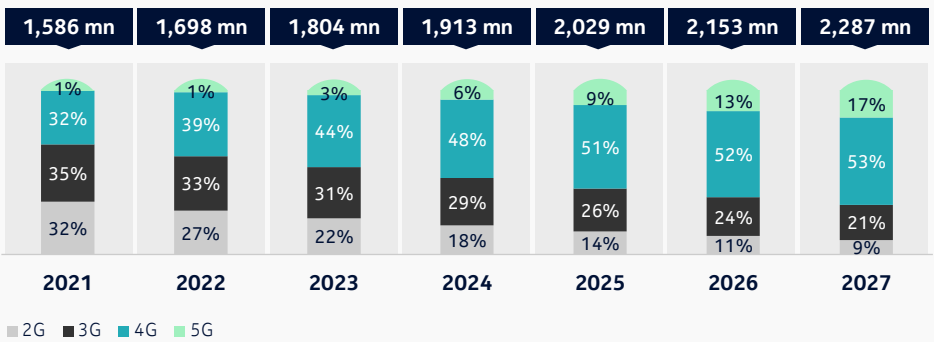
Source: GlobalData

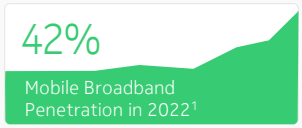
Contents

4G will have more than half of total subscriptions by 2027 and will continue dominating the MEA region

5G is forecasted to increase steadily and will pave way for digital transformation

Subscribers share by technology



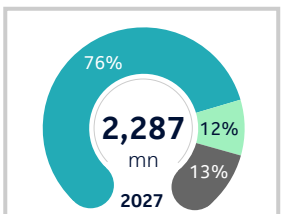


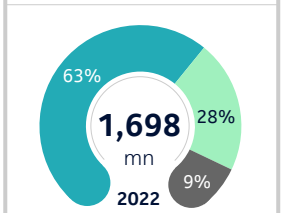
4G subscriber will reach 1,214 mn (**53% of total subscribers**) by 2027.

5G adoption is estimated to reach **380 mn subscribers (17% of total subscribers)** by 2027, majorly driven by GCC[2] region countries.

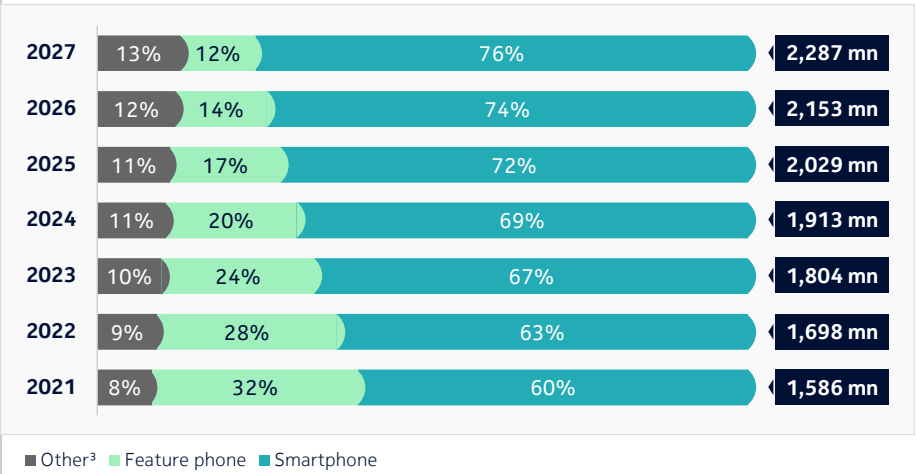
Operators are investing in development of metaverse and upgrading networks for higher bandwidth and low latency.

Smartphones will contribute to 76% of overall subscriptions by 2027





Subscription by type of device



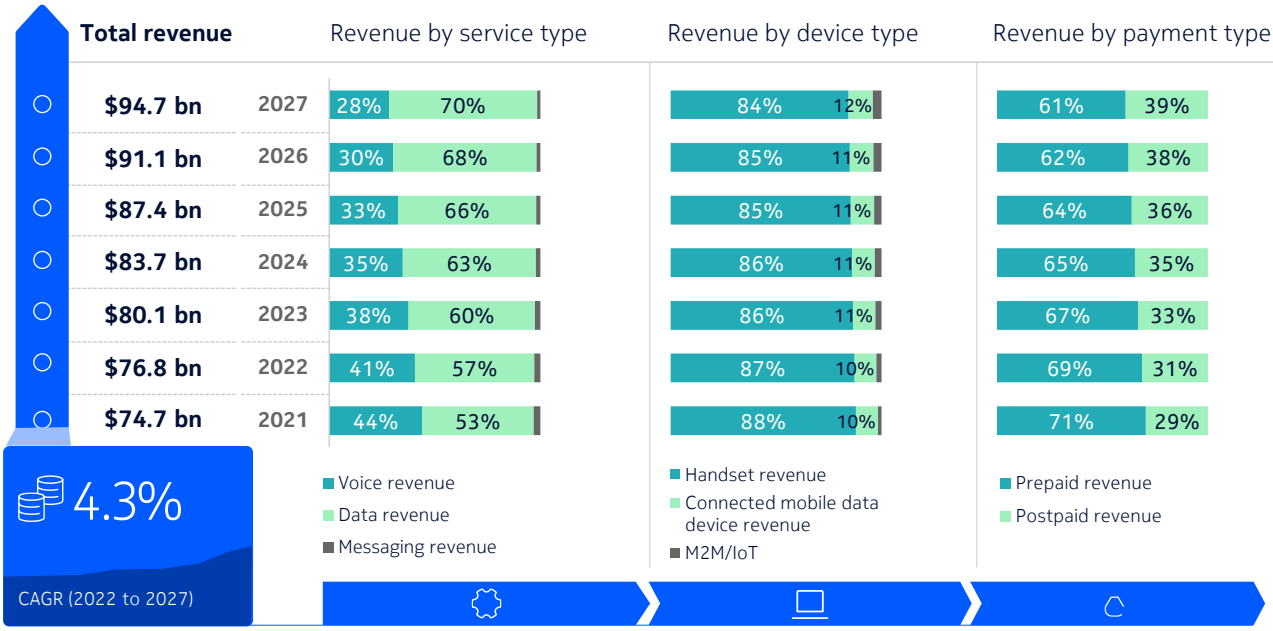
The availability of affordable 5G devices is contributing to an increase in smartphone subscriptions. The smartphone subscribers are increasing with a CAGR of **10%** from 2022 to 2027

Source: GlobalData

[1]Mobile broadband penetration has been calculated by dividing 4G and 5G mobile subscribers by population I [2]GCC countries: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, UAE I [3]Other includes data card, tablet, and M2M/IoT

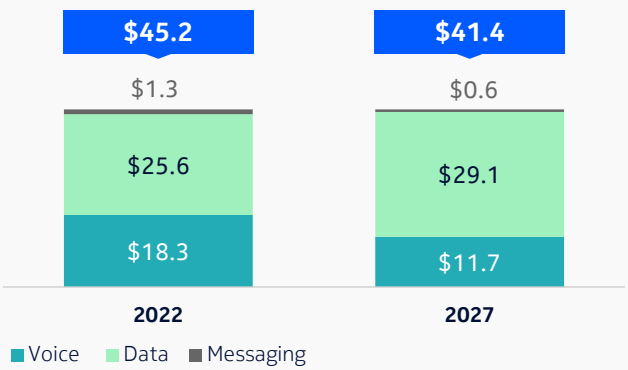
Note: Totals may not add up or exceeds due to rounding

MEA's total mobile revenue is projected to grow at a CAGR of 4.3% between 2022-2027; ARPU is declining



- By the end of 2027, data revenue is estimated to reach **$66.4 bn (70% of total revenue)** whereas voice revenue will stand at **$26.8 bn**.
- Postpaid revenue is increasing at a CAGR of **9%** (from 2022 to 2027) and is projected to reach **$37 bn by 2027** owing to targeted offers and bundling OTT services along with new postpaid plans.

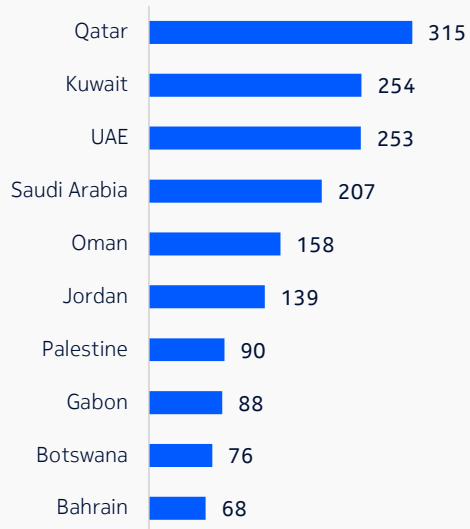
Yearly ARPU (In US Dollars)



- Yearly ARPU is expected to decrease by **$3.8** to reach **$41.4** in 2027; yearly data ARPU is estimated to increase by **$3.4** in 2027.
- Low voice revenue due to growing preference for OTT applications will result in a low yearly voice ARPU in 2027.

Top 10 countries in the MEA region

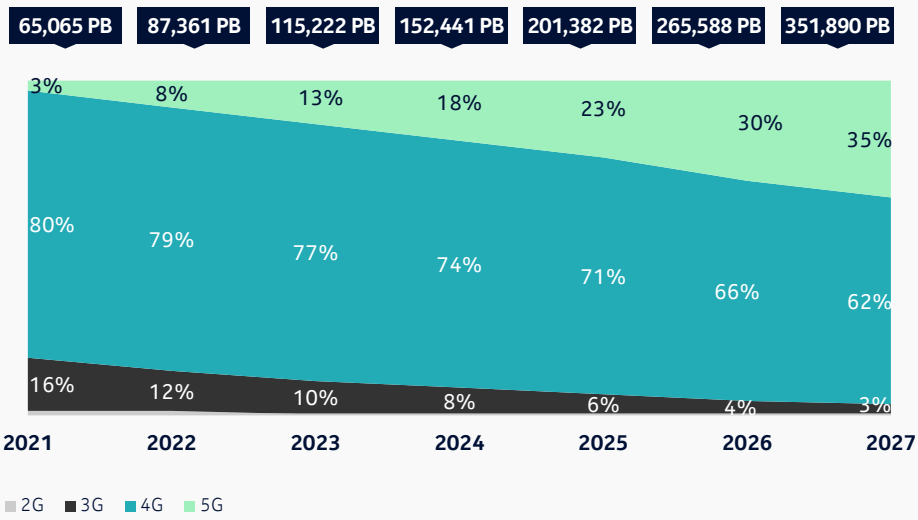
Yearly ARPU (In US Dollars), 2027



Source: GlobalData
Note: ARPU by service type is calculated based on voice/data/messaging revenue divided by total subscribers

Total data traffic to increase at a CAGR of 32% from 2022 to 2027; 4G and 5G will contribute more than 90% of data traffic by 2027

Forecasted data traffic migration (By technology)



4X

Growth in total data traffic from 2022 to 2027

27%

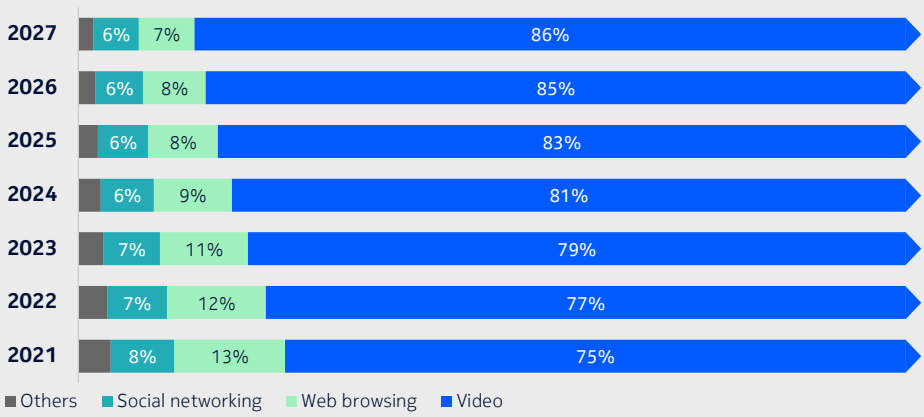
Increase in 5G data traffic market share from 2022 to 2027

Total data traffic (By application)

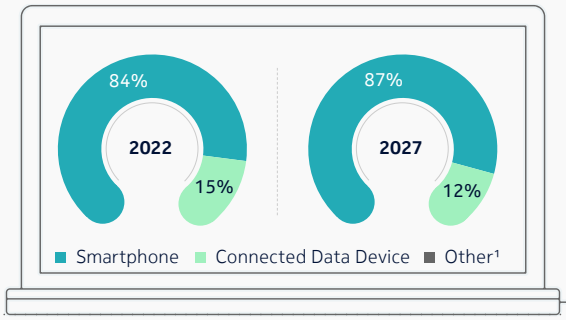
4.5X

2022 to 2027

Video is the most used service with a projected data traffic share of **86% in 2027**



Total data traffic (By device type)



87%

Smartphone data traffic (2027)

Smartphones are expected to drive **87% of total data traffic by 2027** due to growth in the number of smartphone users.

Connected data devices forecast to represent **12% of total data traffic** by 2027.

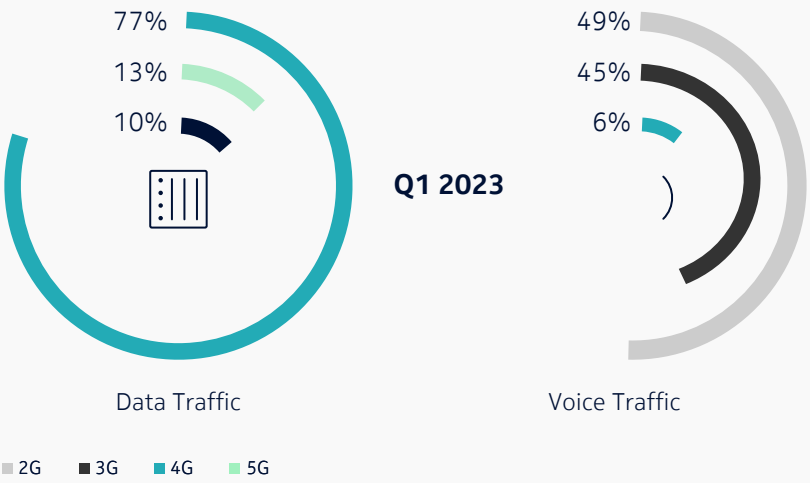
Source: GlobalData

[1]Other Includes feature phone and M2M

High smartphone adoption and rise in 4G and 5G coverage in the region leading to significant increase in data traffic

2G remains as the dominant layer for voice traffic while there is a gradual shift toward VoLTE

Traffic share by technology

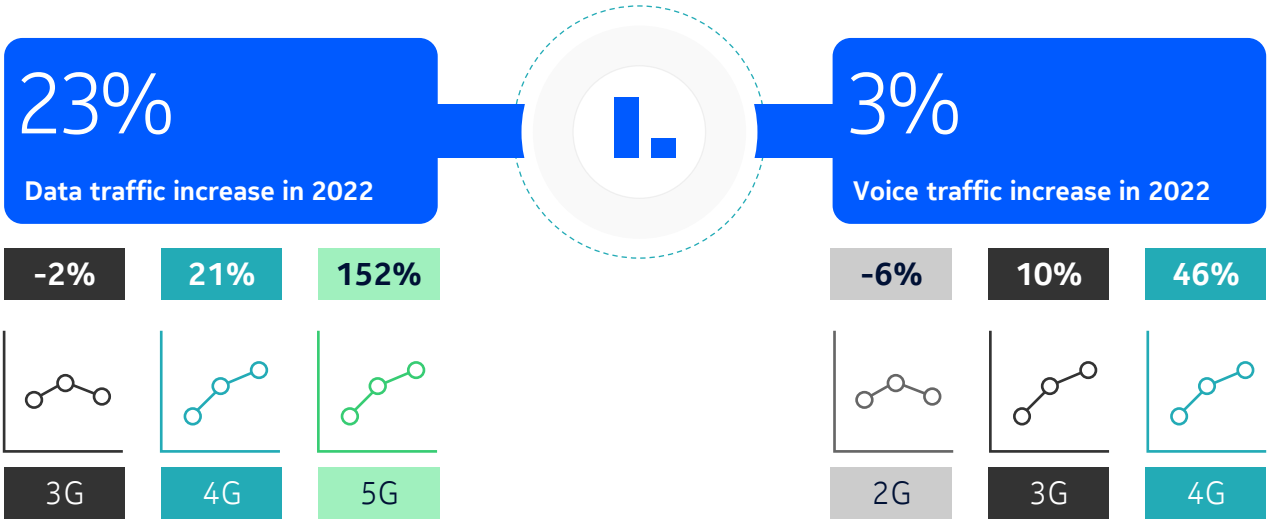


YoY decline in 3G data traffic volume. **5G data** traffic share is more than **13% and crossed 3G data traffic** portion.

4G remains the main technology servicing amongst data users. 77% of overall MEA generated data traffic carried by 4G.

2G Voice Traffic ratio declined gradually with a shift of traffic toward 3G and 4G VoLTE.

Average YoY increase of 23% in data traffic, 3% increase in voice traffic in 2022

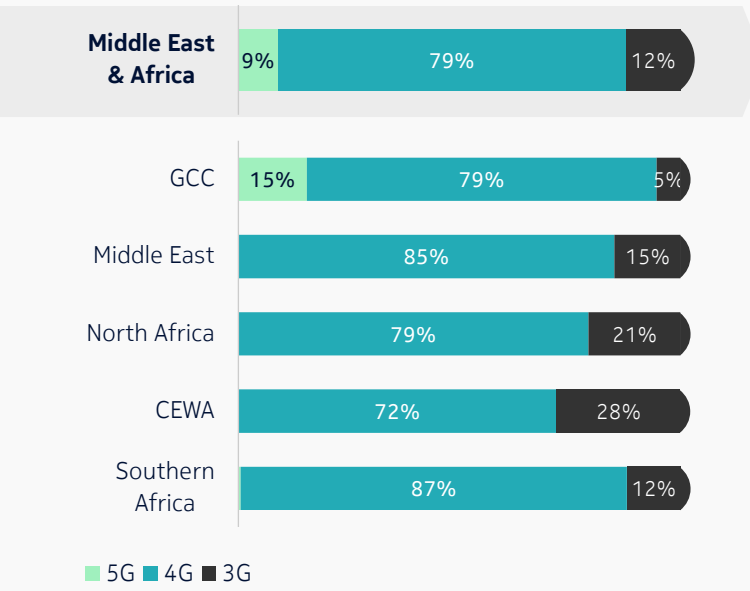


Declining traffic in 2G and 3G to further drive spectrum re-farming towards 4G and 5G.

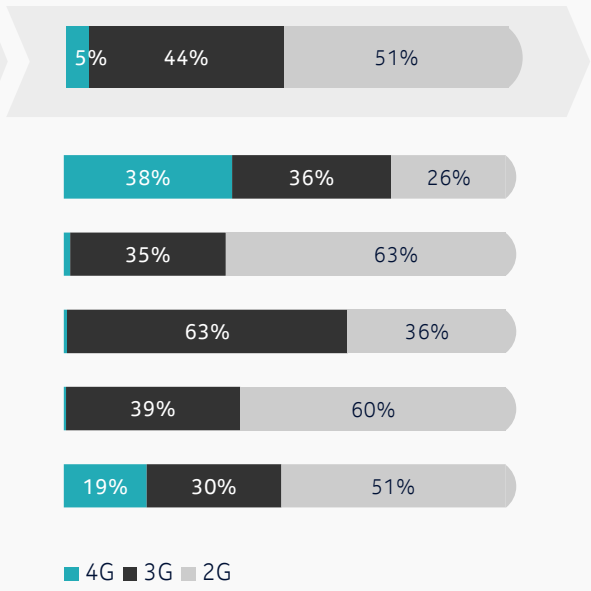
Source: Nokia Intelligence (Based on Nokia's footprint in Middle East and Africa)
Note: Totals may not add up or exceeds due to rounding

4G technology has high data traffic, while 2G and 3G have high voice traffic in the region; lesser number of LTE devices that support 5G

Data Traffic (2022)

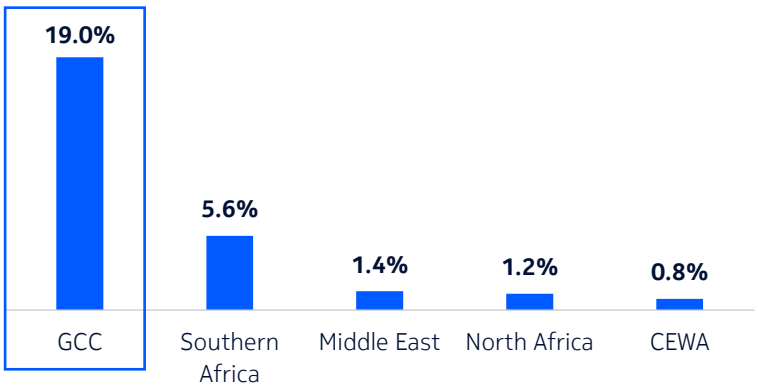


Voice Traffic (2022)



Faster adoption of 5G and VoLTE services observed in GCC countries as compared to the rest of MEA.
5G data traffic has exceeded 3G in GCC countries. Continuous decline in 2G/3G traffic drives operators' decision to sunset legacy technologies.

Share of smart phone devices supporting 5G



- **GCC** currently is the most mature region in terms of 5G device ecosystem with approximately **20% of the smart phones with 5G capability.**
- Many 5G capable devices still connected to 4G layer due to lack of 5G coverage. **5G coverage enhancement will increase the overall 5G traffic share.**

Source: Nokia Intelligence (Based on Nokia's footprint in Middle East and Africa)
Note: Totals may not add up or exceeds due to rounding

Gulf Cooperation Council

Subscribers share by technology and type of device

A look at the revenues and ARPUs

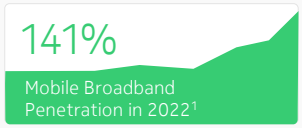
Categorization of the total data traffic by generation, application and device type

Gulf Cooperation Council

4G will dominate till 2024; 5G will grow rapidly from 2022 to 2027 at a CAGR of 41.9%

5G subscribers will grow by 78 mn from 2022 to 2027, Saudi Arabia to contribute more than 60% of new subscribers

Subscribers share by technology

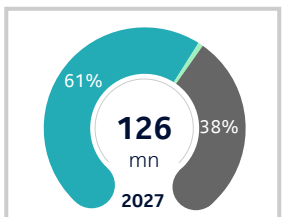


4G subscribers are declining while 5G subscribers are set to reach **94 mn by 2027 (75% of total subscribers)**.

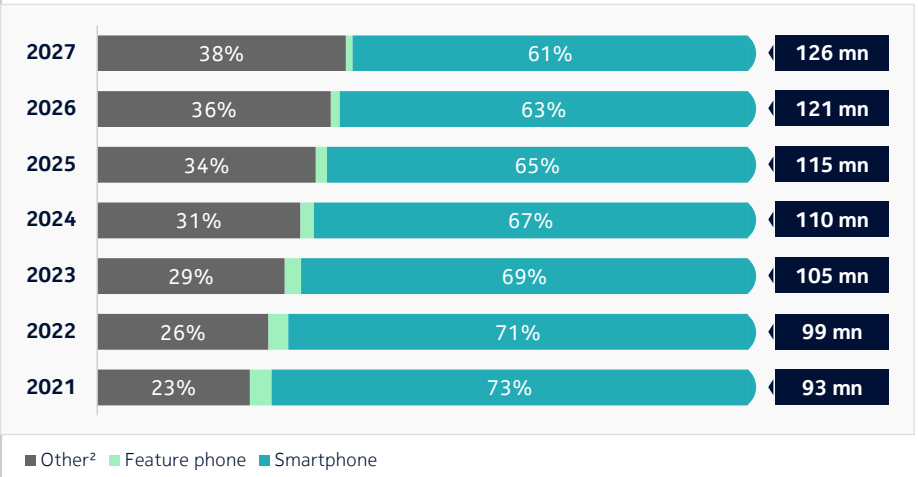
The aggressive push for digital transformation in GCC countries is increasing the usage of 5G.

5G accelerates adoption of emerging technologies like IoT, AI, cloud & edge computing, supporting Saudi 2030 vision.

Smartphone subscriptions are expected to grow by 9% from 2022 to 2027 to reach 77 mn besides increase in the share of other devices such as data cards, tablets, and M2M/IoT



Subscription by type of device



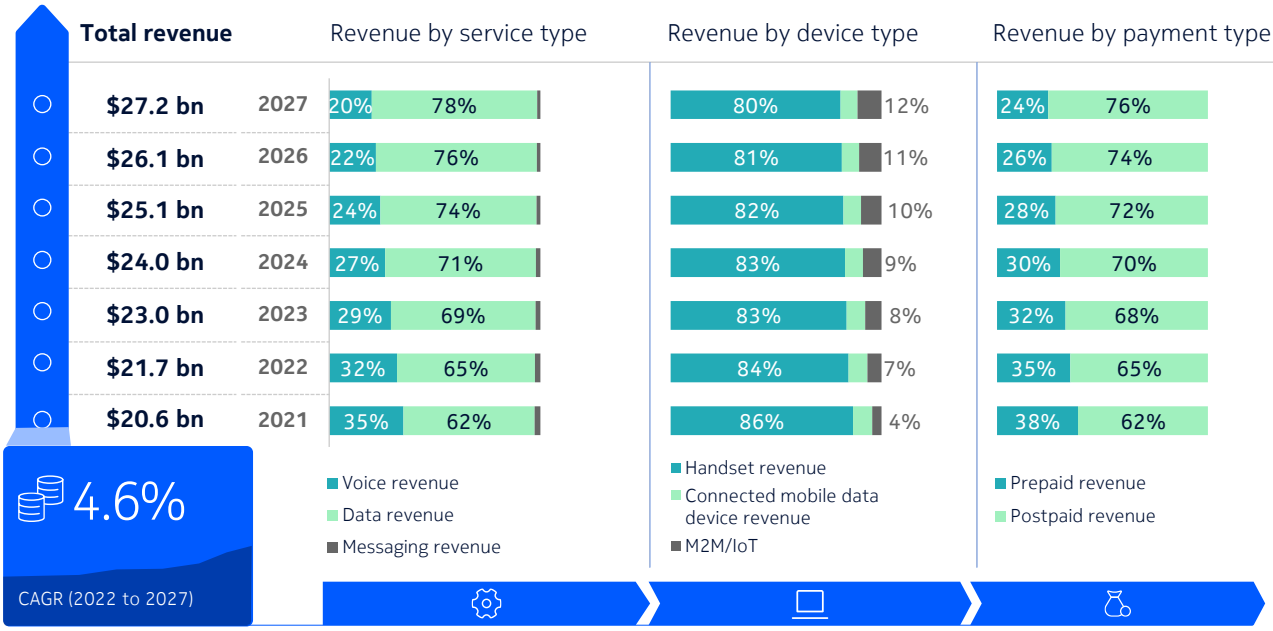
M2M/IoT subscriptions will increase at a CAGR of **16.7% (from 2022 to 2027)** and estimated to reach **38.3 mn by 2027**.

Source: GlobalData

[1]Mobile broadband penetration has been calculated by dividing 4G and 5G mobile subscribers by population I [2]Other includes data card, tablet and M2M/IoT

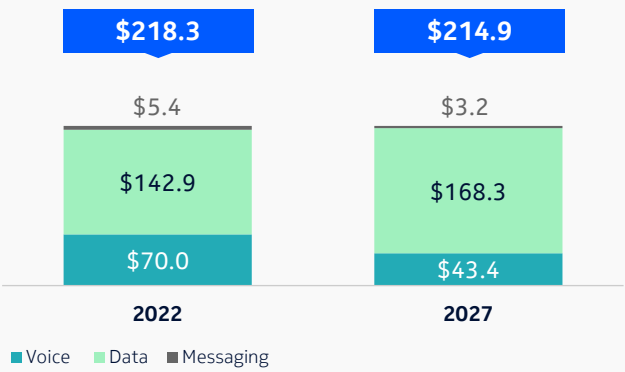
Note: Totals may not add up or exceeds due to rounding

GCC's total mobile revenue is projected to grow at a CAGR of 4.6% between 2022-2027; ARPU is declining



- Driven by the rollout of high-speed networks and increasing smartphone adoption, data revenue is estimated to reach **$21 bn (78% of total service revenue) by 2027**.
- Postpaid revenue is expected to generate more than half of the total revenue by payment type as operators are focussing on migrating prepaid subscribers to postpaid by offering bundling services.

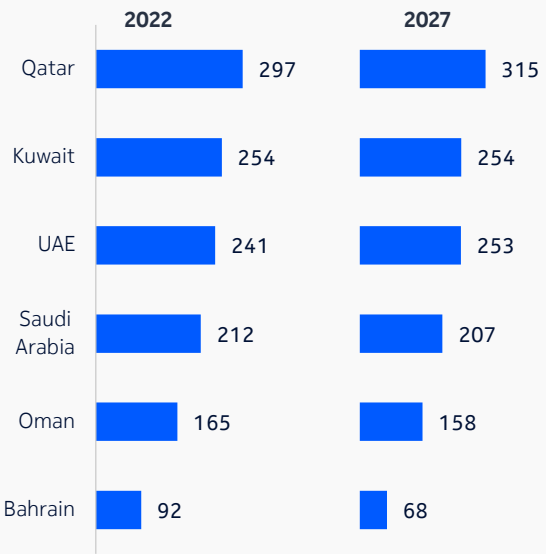
Yearly ARPU (In US Dollars)



- Yearly ARPU in the GCC region is expected to reach **$214.9** in 2027, a **2%** decrease from 2022; yearly voice ARPU is expected to decrease due to the transition to data-centric plans that include OTT-based communications apps.
- In 2027, **Qatar and Kuwait** will continue to be the top countries with the highest yearly ARPU at **$315** and **$254**, respectively.

Countries in the GCC region

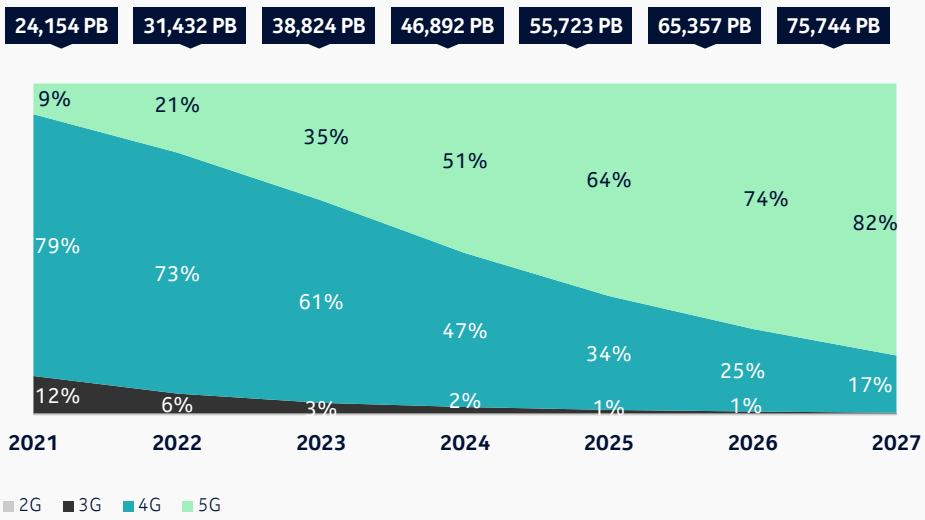
Yearly ARPU (In US Dollars)



Source: GlobalData
Note: ARPU by service type is calculated based on voice/data/messaging revenue divided by total subscribers

Total data traffic will grow significantly from 2022 to 2027 with a CAGR of 19%

Forecasted data traffic migration (By technology)



2.4X

Growth in total data traffic from 2022 to 2027

61%

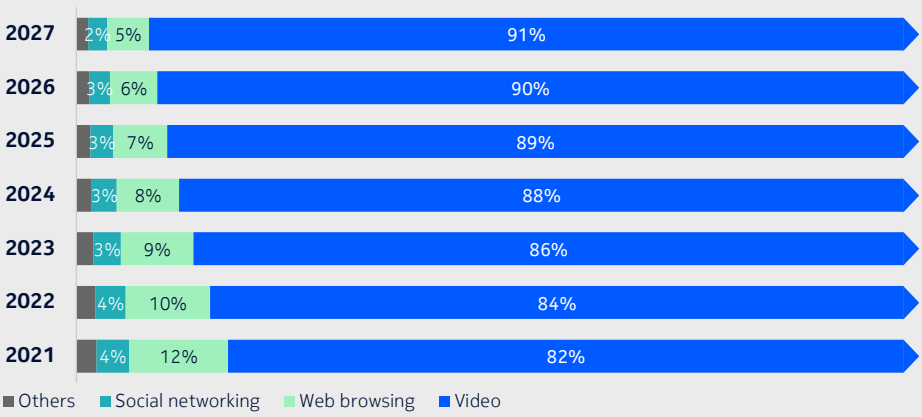
Increase in 5G data traffic market share from 2022 to 2027

Total data traffic (By application)

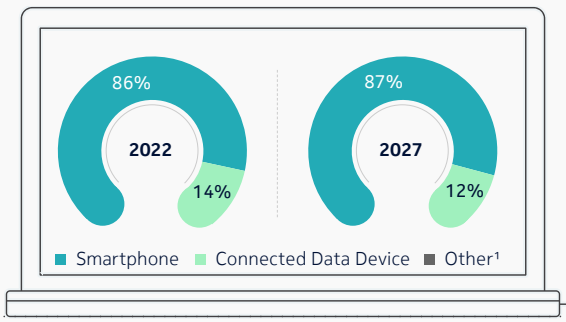
2.6X

2022 to 2027

Video is the most used service with a projected data traffic share of **91% in 2027**



Total data traffic (By device type)



87%

Smartphone data traffic (2027)

Smartphones are projected to drive **87% of total data traffic by 2027** driven by user behaviour shift to be always connected.

Connected data devices expected to represent **12% of total data traffic by 2027**.

Source: GlobalData

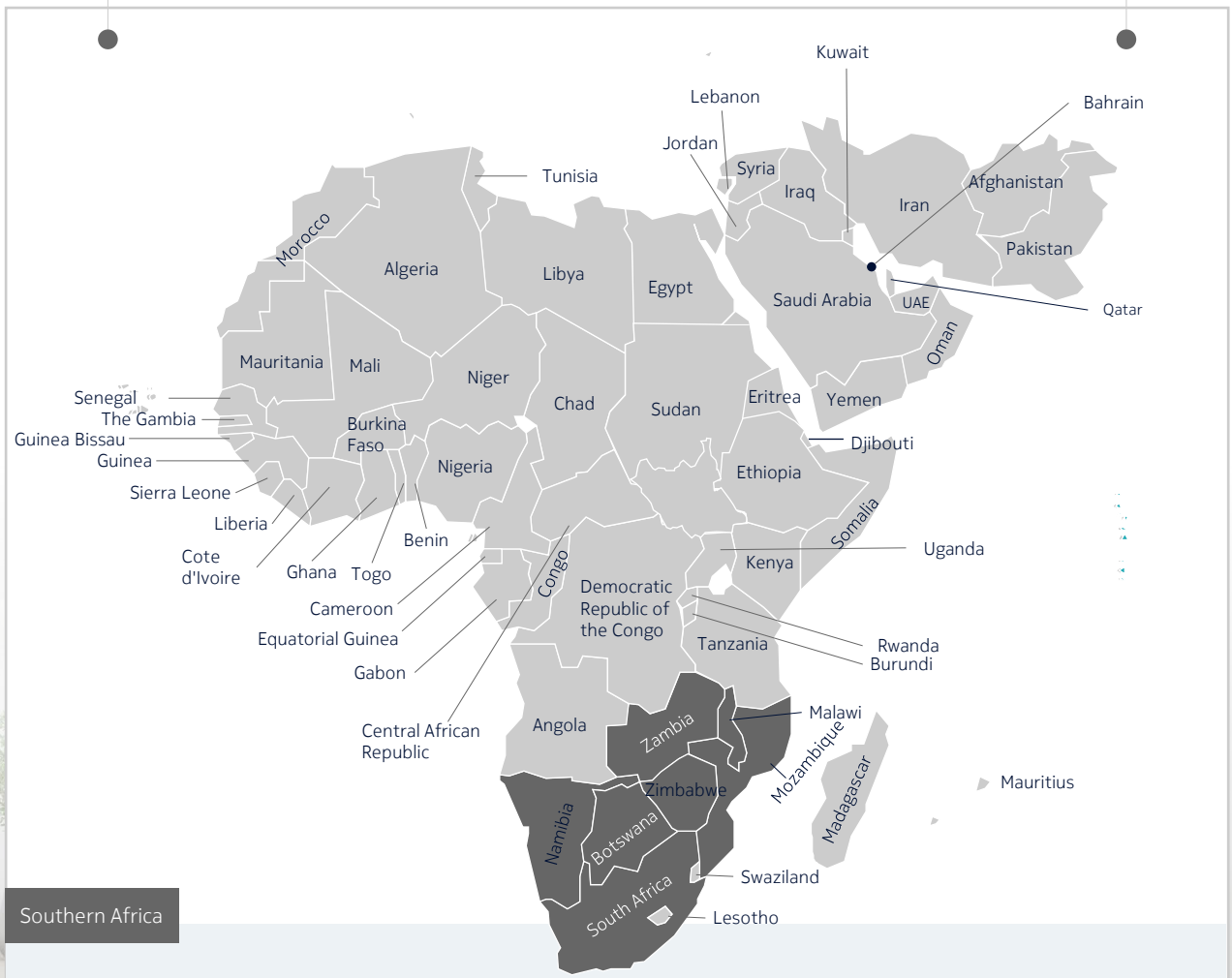
[1]Other Includes feature phone and M2M

Southern Africa

Subscribers share by technology and type of device

A look at the revenues and ARPUs

Categorization of the total data traffic by generation, application and device type

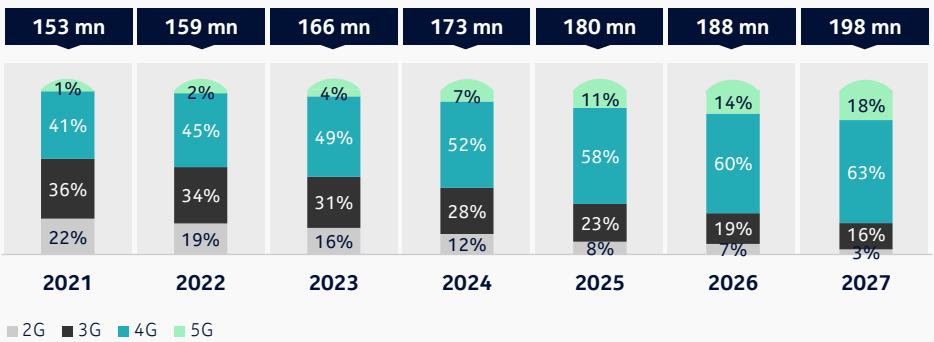


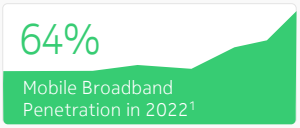
Southern Africa

4G will continue to expand till 2027; 5G is on the customer service provider's radar

5G adoption is increasing gradually whereas 4G adoption is constantly growing

Subscribers share by technology



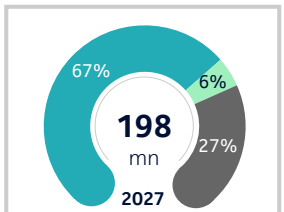


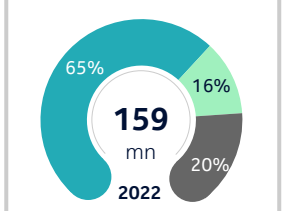
Total subscribers are expected to grow by **24%** from 2022 to 2027 to reach **198 mn**.

5G subscribers are constantly rising and are estimated to reach **36 mn subscribers (18% of total subscribers)** by 2027.

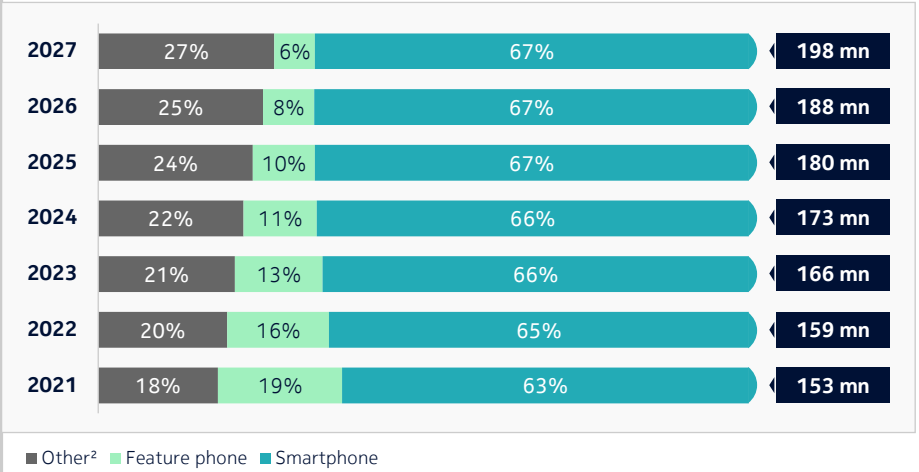
4G is dominating the Southern Africa region with a subscriber base set to reach **124 mn** by 2027 **(63% of total subscribers)**.

Smartphone subscription is projected to reach 132 mn by 2027, feature phone subscription is on a downward trajectory





Subscription by type of device



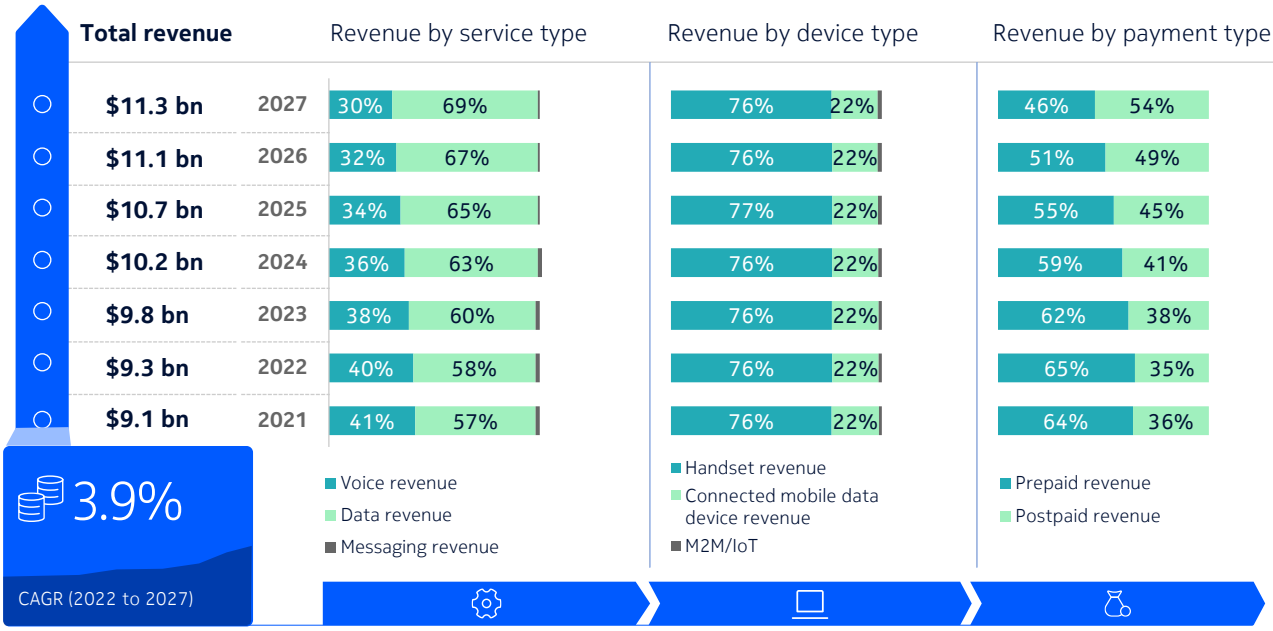
M2M/IoT is expected to increase at a CAGR of **15.6% from 2022-2027**.

Source: GlobalData

[1]Mobile broadband penetration has been calculated by dividing 4G and 5G mobile subscribers by population I [2]Other includes data card, tablet, and M2M/IoT

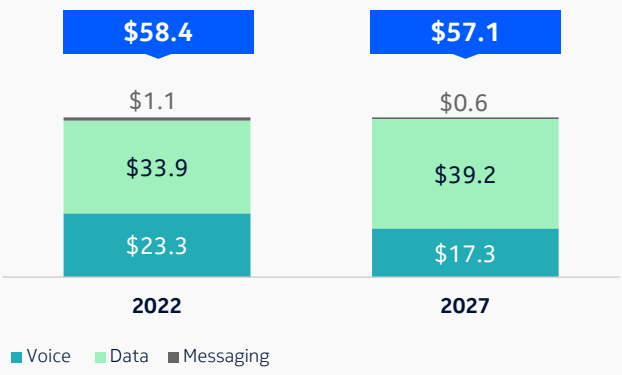
Note: Totals may not add up or exceeds due to rounding

Southern Africa's total mobile revenue is projected to grow at a CAGR of 3.9% between 2022-2027; ARPU is declining



- Data revenue is estimated to increase marginally to reach **$8 bn by 2027**.
- Prepaid revenue is higher than postpaid revenue in the region as there are many lower-income people who can afford prepaid only; the postpaid service package is often expensive and needs to be paid monthly.

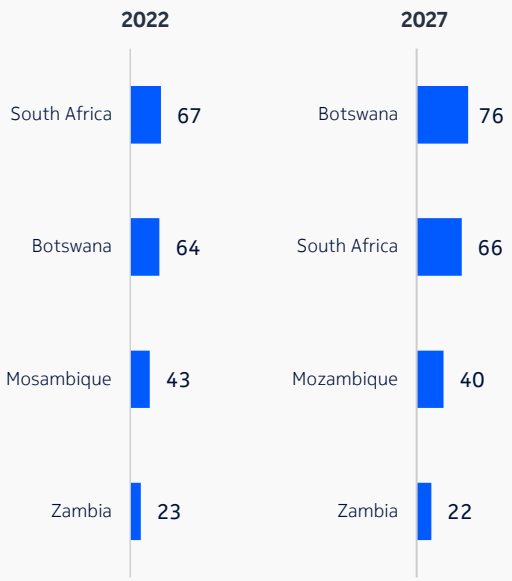
Yearly ARPU (In US Dollars)



- Yearly ARPU is expected to decrease marginally by **$1.3 in 2027**; yearly data ARPU will grow by **$5.2 by 2027,** supported by high data revenue.
- Yearly voice ARPU is projected to decrease as operators have been focusing on offering data-centric plans.

Countries in Southern Africa region

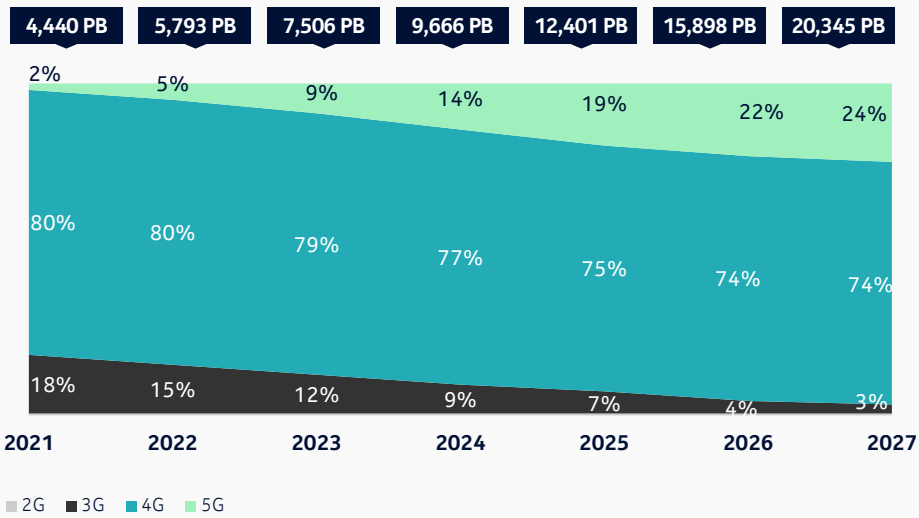
Yearly ARPU (In US Dollars)



Source: GlobalData
Note: ARPU by service type is calculated based on voice/data/messaging revenue divided by total subscribers

With a CAGR of 29%, total data traffic is expected to increase from 2022 to 2027; 4G and 5G to drive 98% of data traffic by 2027

Forecasted data traffic migration (By technology)



3.5X

Growth in total data traffic from 2022 to 2027

19%

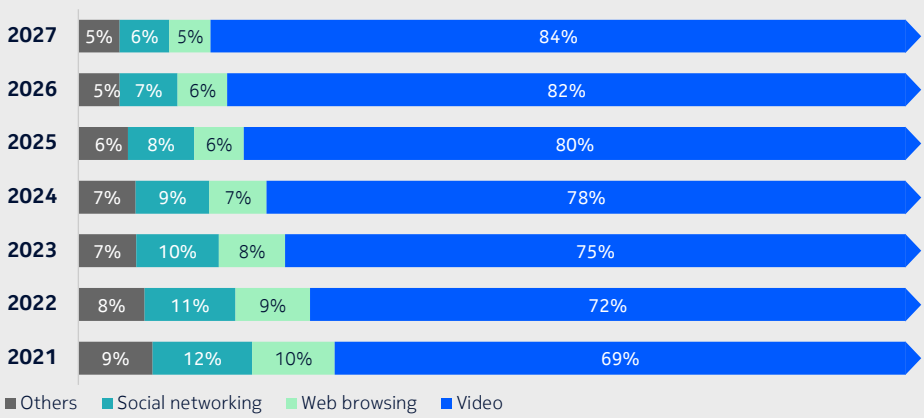
Increase in 5G data traffic market share from 2022 to 2027

Total data traffic (By application)

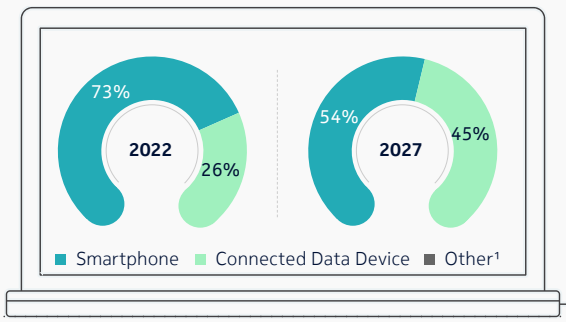
4X

2022 to 2027

Video is the most used service with a projected data traffic share of **84% in 2027**



Total data traffic (By device type)



54%

Smartphone data traffic (2027)

Although, it is projected that smartphones to drive most of the total data traffic in 2027 but its share would decline by **19% from 2022**, showing subscribers inclination towards connected data device.

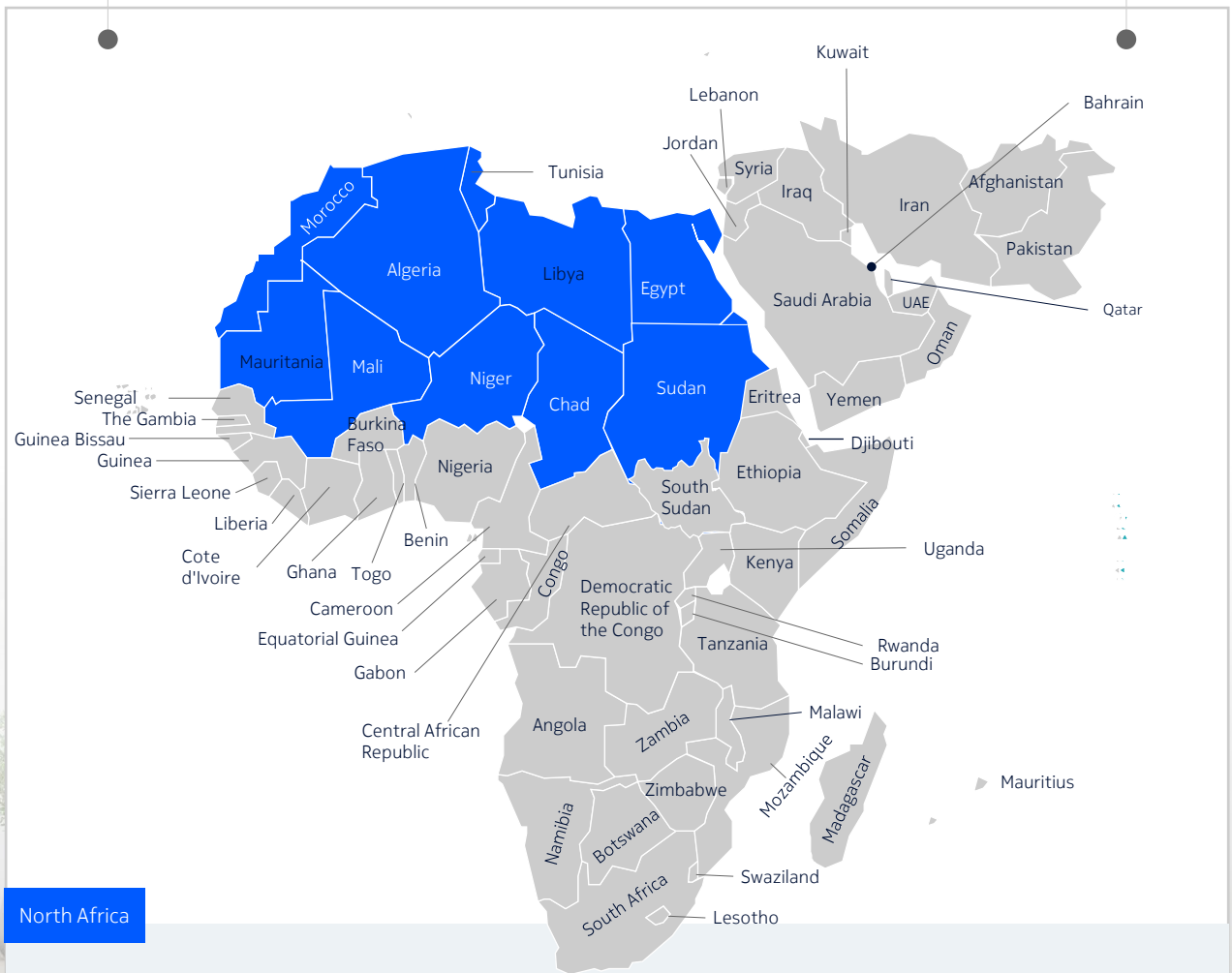
Source: GlobalData
[1]Other Includes feature phone and M2M

North Africa

Subscribers share by technology and type of device

A look at the revenues and ARPUs

Categorization of the total data traffic by generation, application and device type

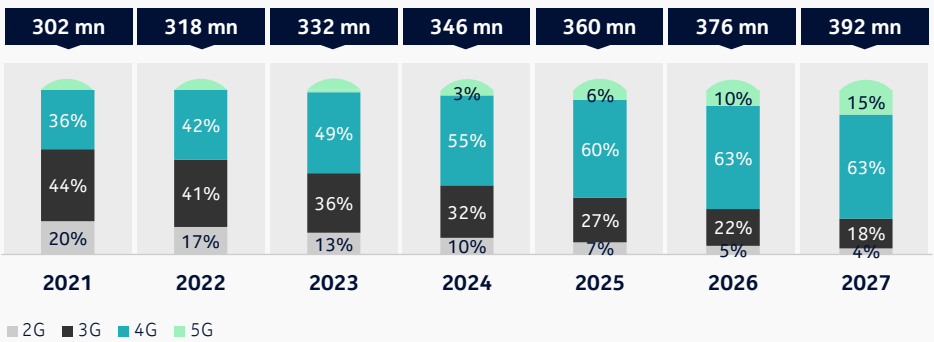


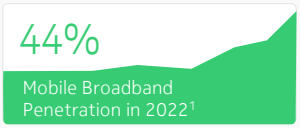
North Africa

4G will remain dominant across North Africa till 2027; 5G is set to gain the momentum

Growth in total subscribers has been led by both 4G & 5G subscribers

Subscribers share by technology



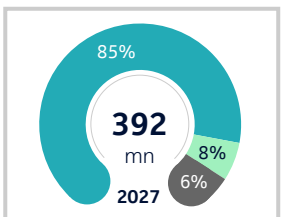


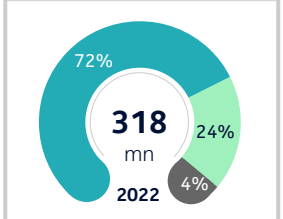
Total subscribers are projected to increase by **23%** from 2022 to 2027 to reach 392 mn.

4G to account for **more than half of the total subscribers** by 2027 while only **15%** of the total subscribers will have 5G.

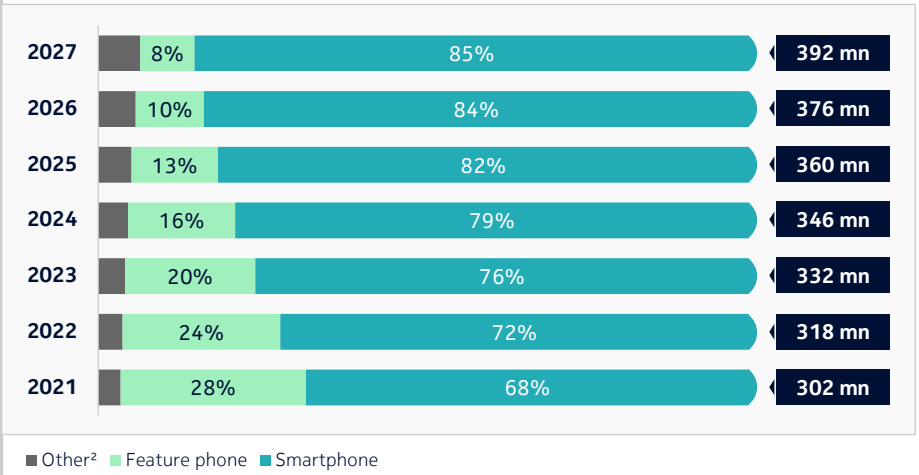
By 2027, 2G and 3G will have only a **22% share of total subscribers** as operators are investing more in 4G and 5G technology.

Smartphone subscriptions will grow from 229 mn in 2022 to 334 mn in 2027 supported by the increasing availability of smartphones





Subscription by type of device



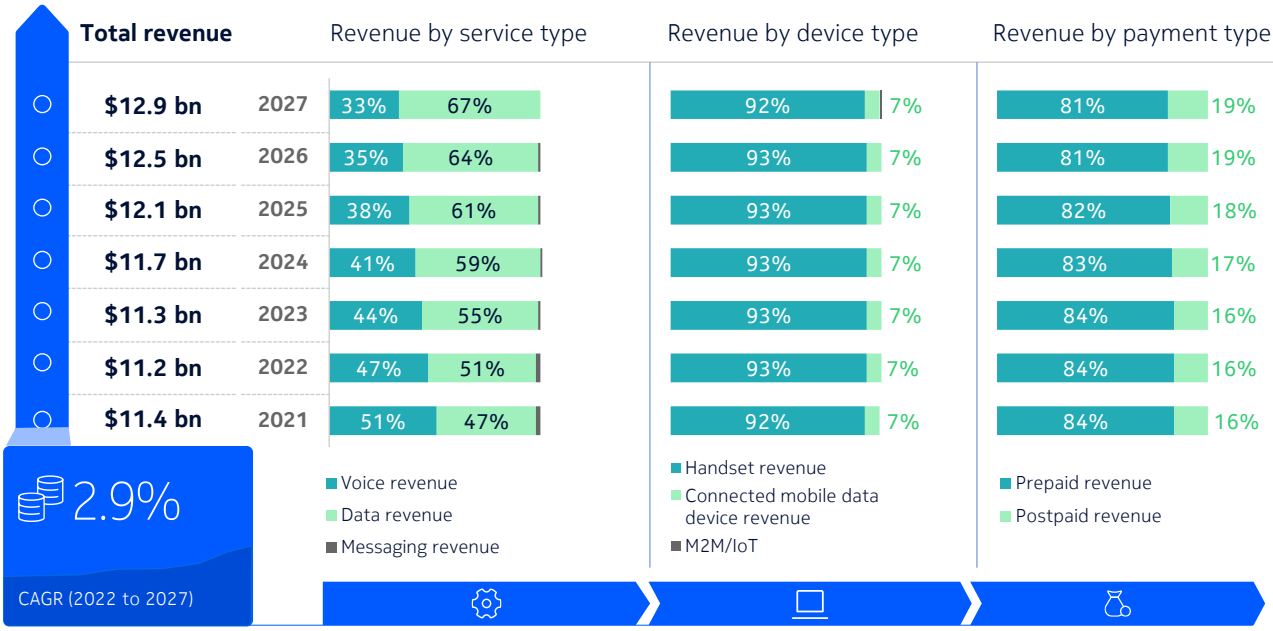
Smartphone subscription is projected to grow by **46% from 2022 to 2027 to reach 334 mn**; feature phone subscription is declining.

Source: GlobalData

[1]Mobile broadband penetration has been calculated by dividing 4G and 5G mobile subscribers by population | [2]Other includes data card, tablet, and M2M/IoT

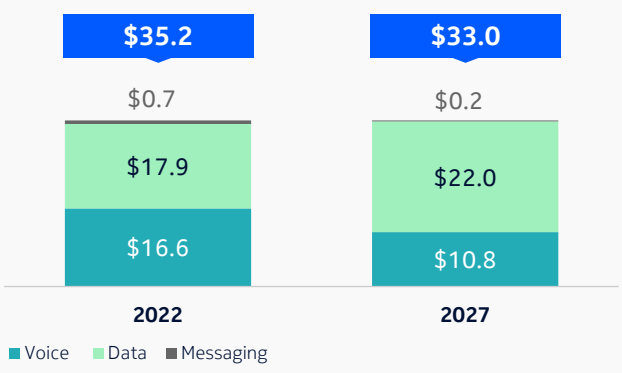
Note: Totals may not add up or exceeds due to rounding

North Africa's total mobile revenue is projected to grow at a CAGR of 2.9% between 2022-2027; ARPU is declining marginally



- Data revenue is estimated to increase from **$5.7 bn in 2022** to reach **$8.6 bn by 2027**, driven by increasing mobile data consumption.
- Handset revenue is expected to remain the main contributor in terms of revenue by device type and is projected to reach **~$12 bn** by 2027.

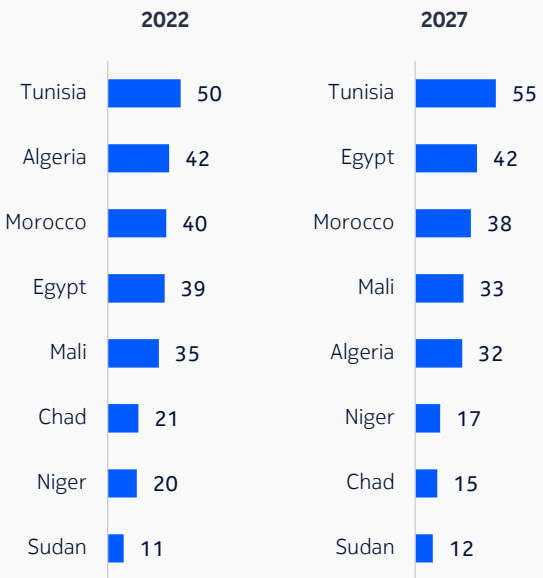
Yearly ARPU (In US Dollars)



- Yearly ARPU is expected to decrease by **$2.3** to reach **$33** in 2027.
- In 2027, **Tunisia and Egypt** to be the top countries with the highest yearly ARPU at **$55** and **$42**, respectively.

North Africa region countries

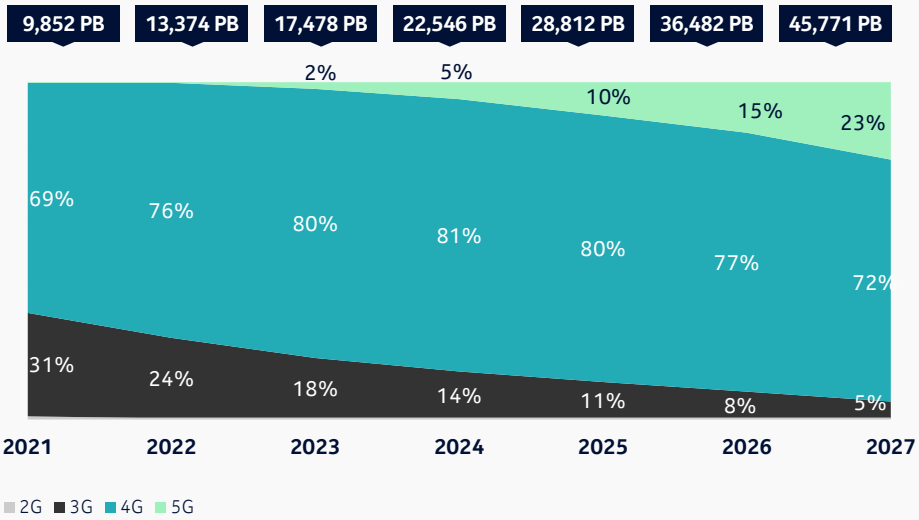
Yearly ARPU (In US Dollars)



Source: GlobalData
Note: ARPU by service type is calculated based on voice/data/messaging revenue divided by total subscribers

Data traffic to increase with a CAGR of 28% from 2022 to 2027

Forecasted data traffic migration (By technology)



3.4X

Growth in total data traffic from 2022 to 2027

23%

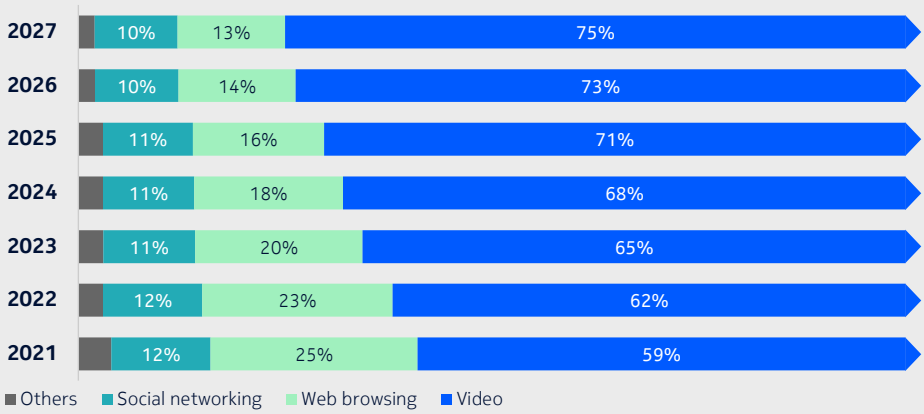
Increase in 5G data traffic market share from 2022 to 2027

Total data traffic (By application)

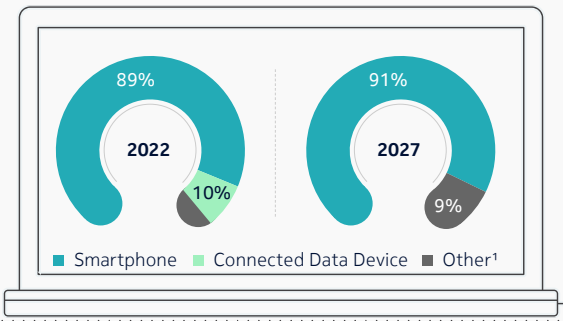
4X

2022 to 2027

Video is the most used service with a projected data traffic share of **75% in 2027**



Total data traffic (By device type)



91%

Smartphone data traffic (2027)

High smartphone penetration in the region results in high smartphone data traffic (**91% of total data traffic by 2027**).

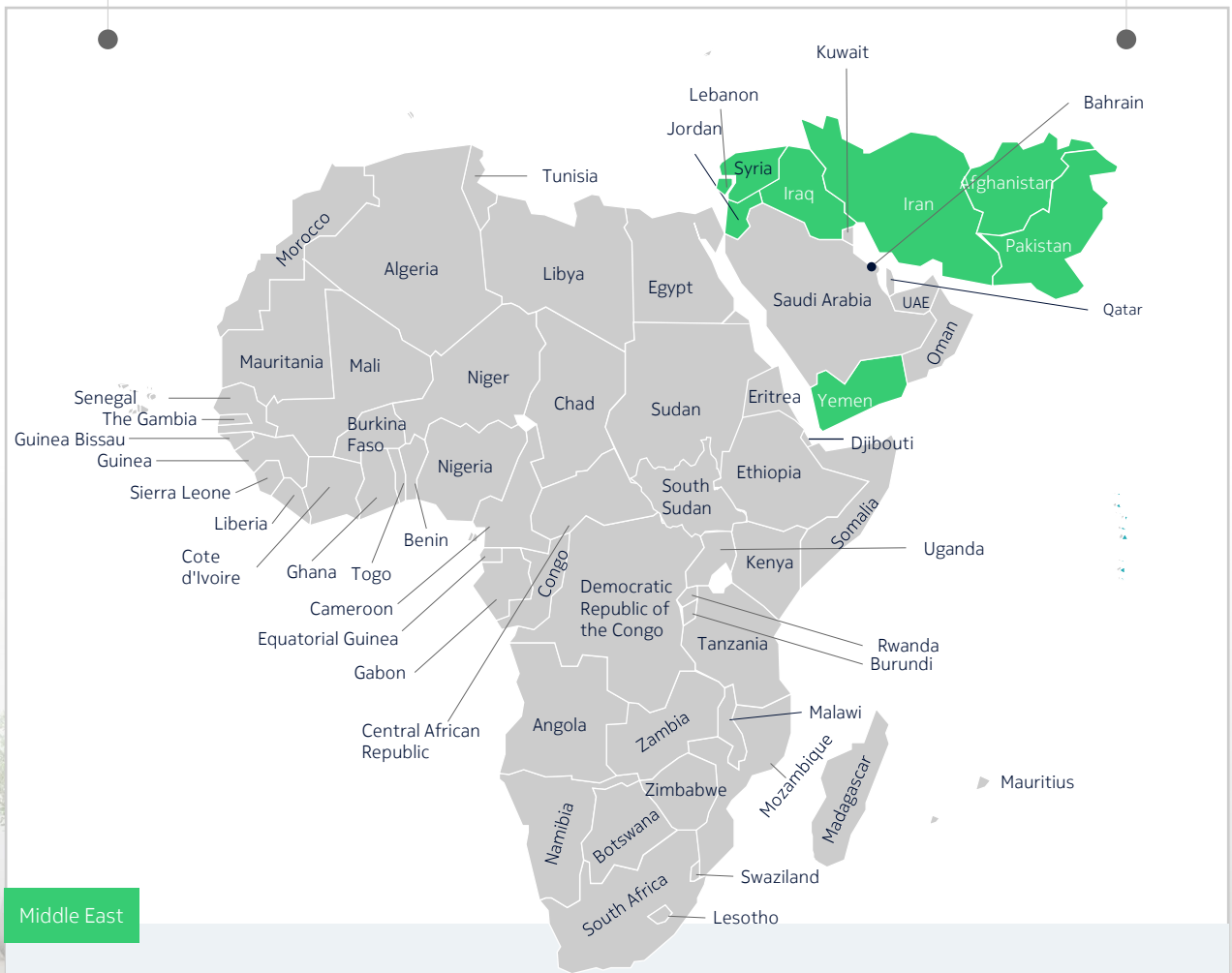
Source: GlobalData
[1]Other Includes feature phone and M2M

Middle East

Subscribers share by technology and type of device

A look at the revenues and ARPUs

Categorization of the total data traffic by generation, application and device type

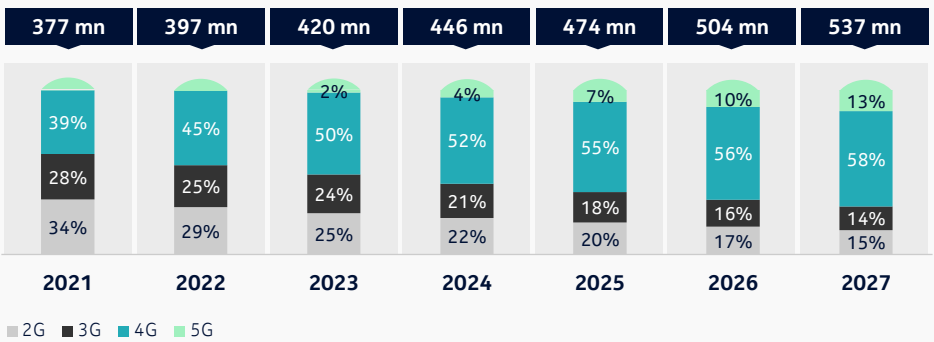


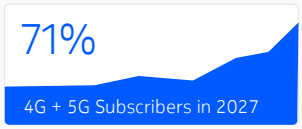
Middle East

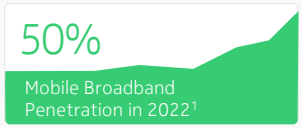
4G is dominating in the Middle East region while 5G is at nascent stage

5G remains at a developing stage. The current adoption rate of just 1% is expected to grow to 13% by 2027

Subscribers share by technology





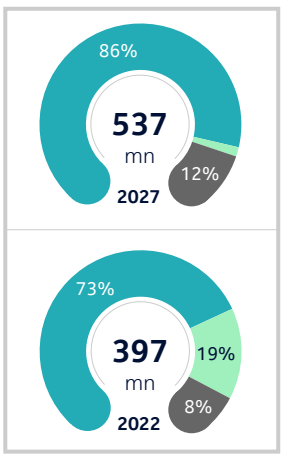


4G subscribers are dominating the Middle East region, projected to reach **311 mn (58% of total subscribers)** by 2027 while 5G adoption increasing steadily.

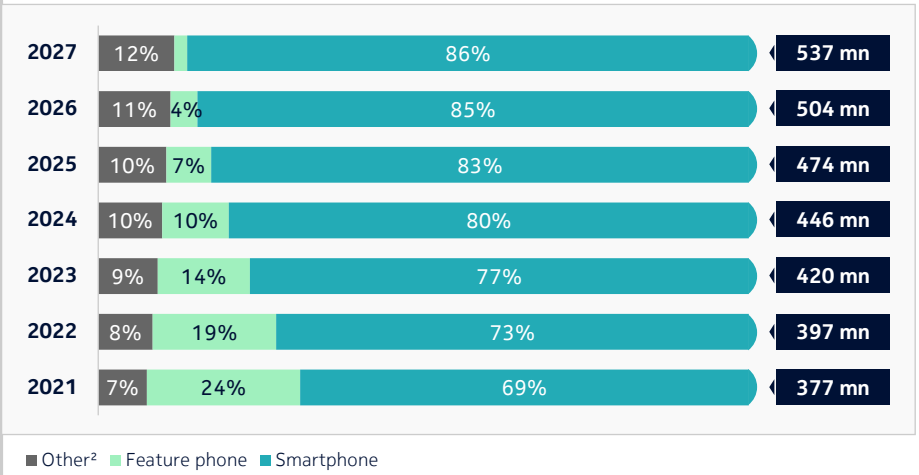
2G and 3G subscribers are expected to decline as operators are investing more on 4G and 5G technology.

Pakistan will contribute **~55% (295 mn)** of subscribers in the region by 2027.

Smartphone subscriptions are projected to increase by 61% from 2022 – 2027 to reach 463 mn



Subscription by type of device



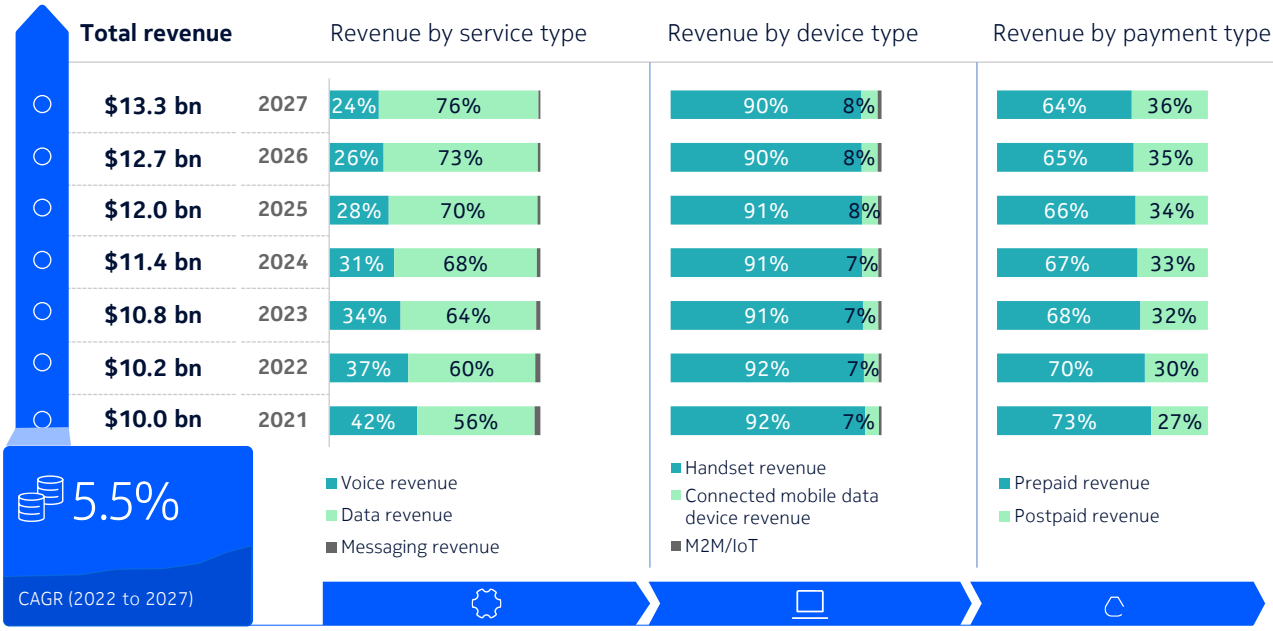
Subscription by feature phones is expected to decrease to reach **10 mn by 2027** as operators are moving towards 4G and 5G.

Source: GlobalData

[1]Mobile broadband penetration has been calculated by dividing 4G and 5G mobile subscribers by population I [2]Other includes data card, tablet, and M2M/IoT

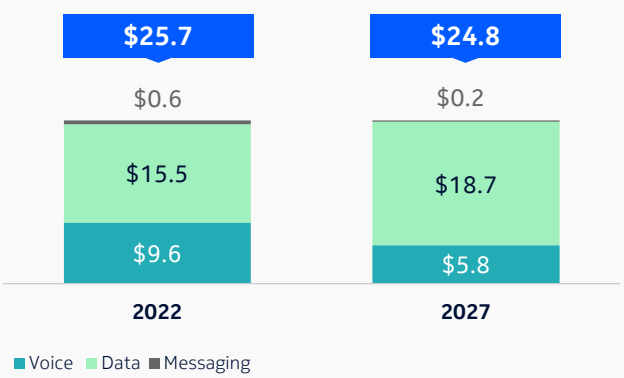
Note: Totals may not add up or exceeds due to rounding

Middle East's total mobile revenue is projected to grow at a CAGR of 5.5% between 2022-2027; ARPU is declining marginally



- Total revenue is projected to increase by **30% to reach $13.3 bn**.
- Data revenue is estimated to reach **~$10 bn by 2027** and will be **3/4th of total revenue** by that time.

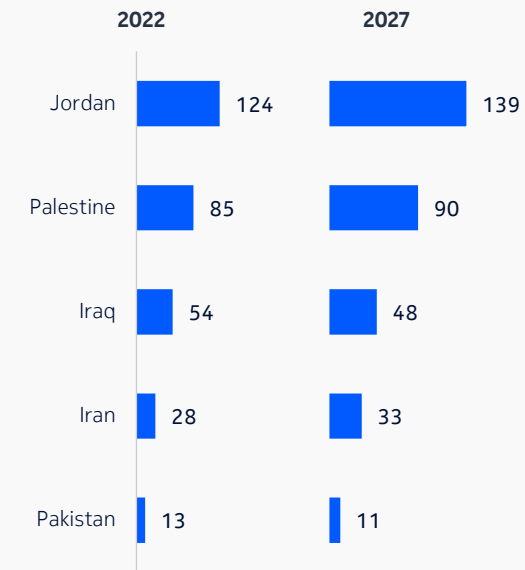
Yearly ARPU (In US Dollars)



- Yearly ARPU is estimated to decrease marginally to reach **$24.8 in 2027**.
- Yearly voice ARPU is projected to decline by **$3.8 in 2027** as operators are offering unlimited voice as a basic feature on most of their prepaid and postpaid bundled plans.

Middle East region countries

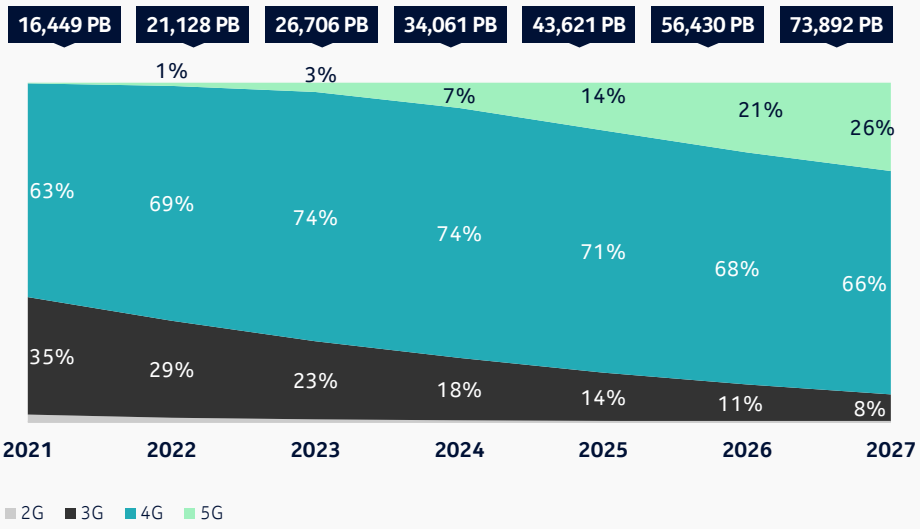
Yearly ARPU (In US Dollars)



Source: GlobalData
Note: ARPU by service type is calculated based on voice/data/messaging revenue divided by total subscribers

Data traffic will continue to grow as more subscribers are opting for 4G and 5G in the region

Forecasted data traffic migration (By technology)



3.5X

Growth in total data traffic from 2022 to 2027

25%

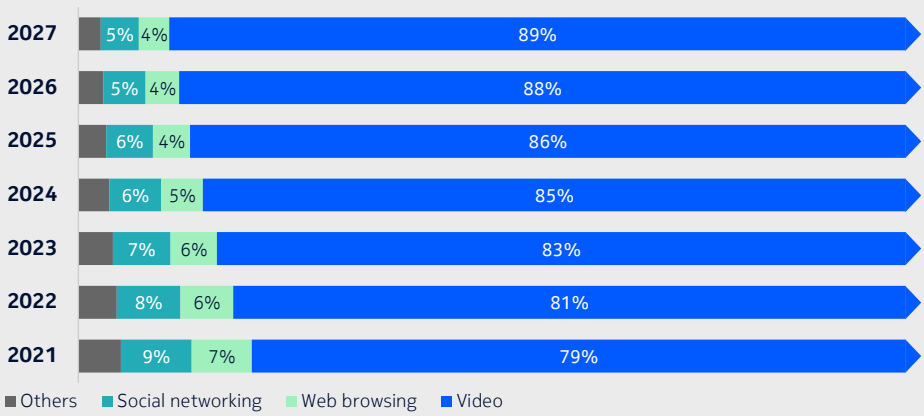
Increase in 5G data traffic market share by 2027 from 2022

Total data traffic (By application)

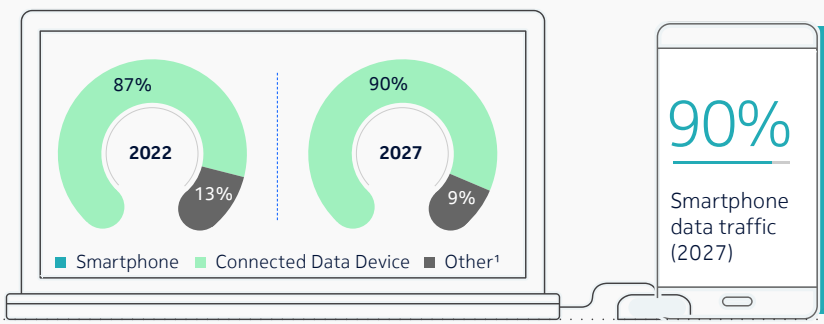
4X

2022 to 2027

Video is the most used service with a projected data traffic share of **89% in 2027**



Total data traffic (By device type)



90%

Smartphone data traffic (2027)

A significant increase in smartphone adoption will drive **90% of smartphone data traffic by 2027**.

Connected data devices expected to represent **9% of total data traffic by 2027**.

Source: GlobalData

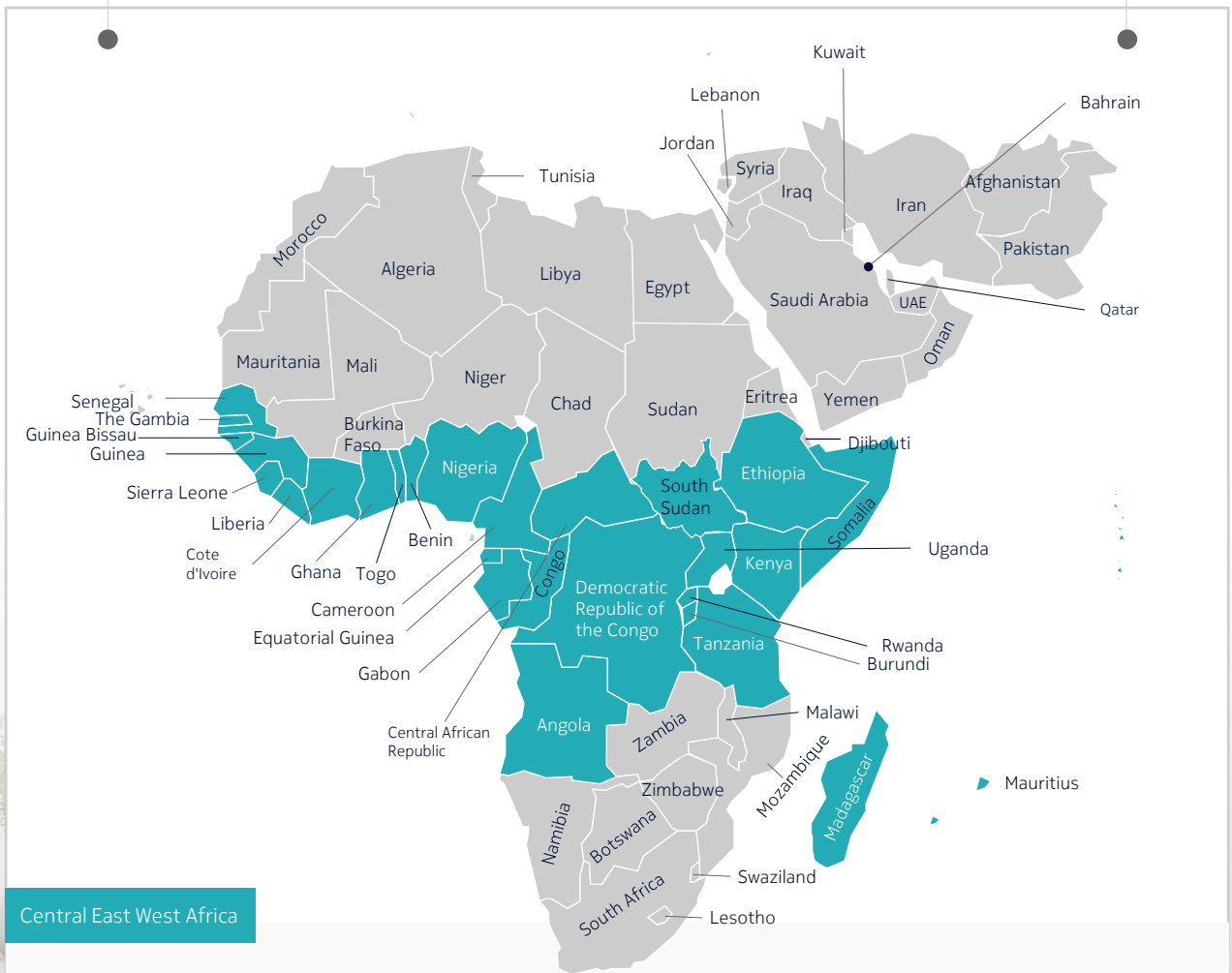
[1]Other Includes feature phone and M2M

Central East West Africa

Subscribers share by technology and type of device

A look at the revenues and ARPUs

Categorization of the total data traffic by generation, application and device type

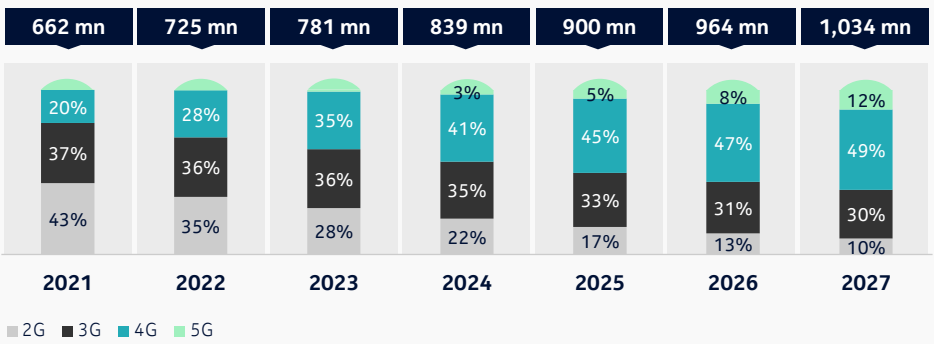


Central East West Africa

4G to dominate the Central East West Africa region with a 2.4X increase in subscribers from 2022 - 2027

From 2024, 4G will predominate in the Central East West Africa region while 5G subscribers are expected to grow steadily

Subscribers share by technology



7.4%
Subscribers CAGR (2022 to 2027)

61%
4G + 5G Subscribers in 2027

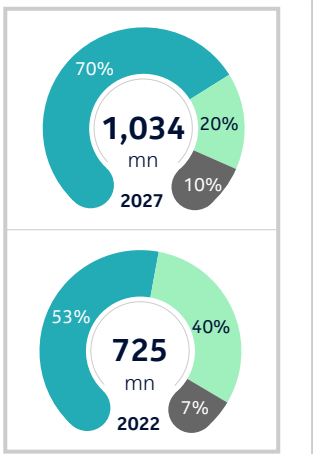
26%
Mobile Broadband Penetration in 2022[1]

Currently, 2G and 3G subscribers account for **more than half of the total subscribers**. However, these are projected to decline as operators will shift to 4G and 5G.

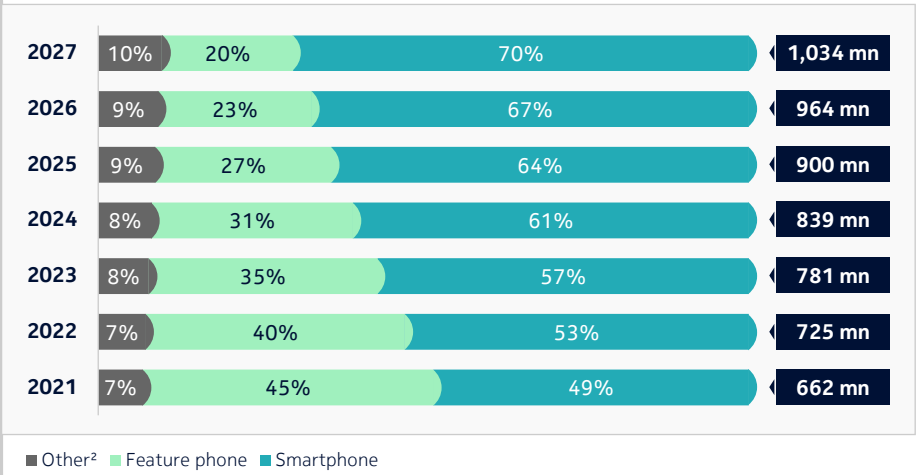
By 2027, **49% (504 mn)** of the total subscribers are expected to use 4G whereas only **12% (123 mn)** will have 5G.

Nigeria, Ethiopia, and Kenya to lead the region in terms of 5G subscribers in 2027 with **67.8 mn subscribers**.

Smartphone subscription is anticipated to increase over the time as operators are moving towards 4G and 5G technology



Subscription by type of device



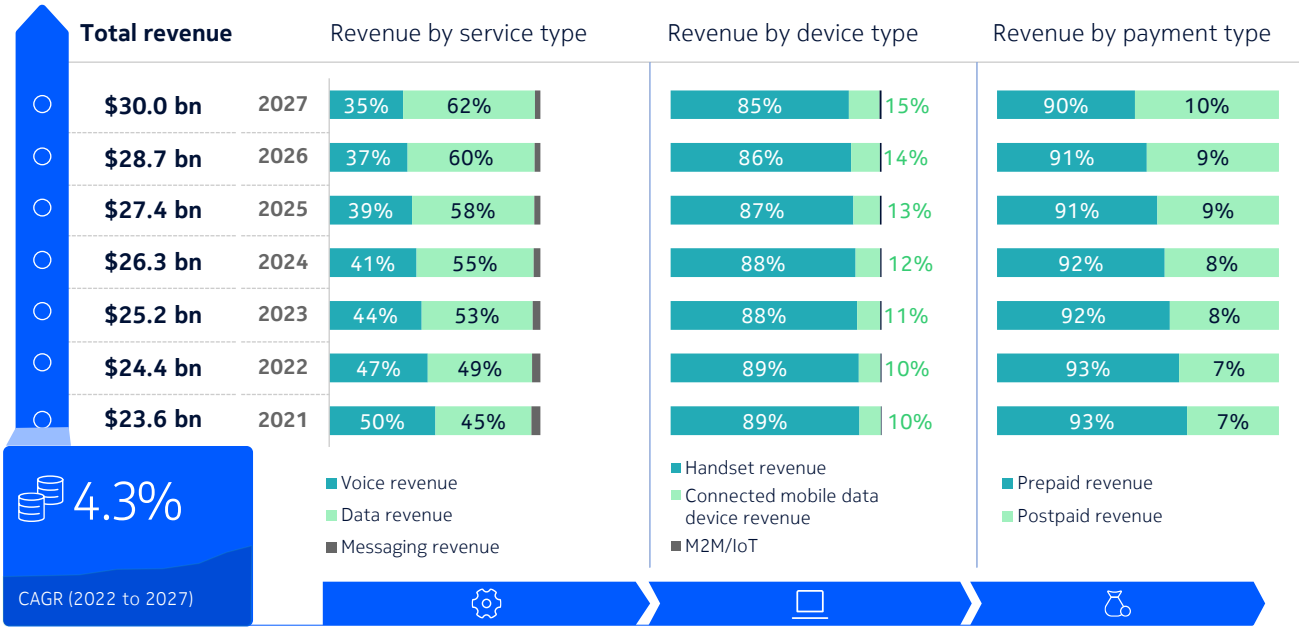
Only **209 mn** subscribers are expected to have feature phone subscriptions by 2027, compared to **724 mn smartphone subscribers**.

Source: GlobalData

[1]Mobile broadband penetration has been calculated by dividing 4G and 5G mobile subscribers by population I [2]Other includes data card, tablet, and M2M/IoT

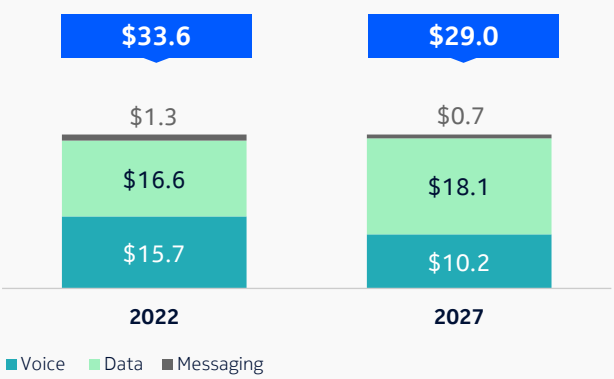
Note: Totals may not add up or exceeds due to rounding

Central East West Africa's total revenue is projected to grow at a CAGR of 4.3% between 2022-2027; ARPU is projected to decrease by $4.6 by 2027



- Total revenue is projected to increase by **23%** from 2022 to 2027 to reach **$30 bn**.
- Data revenue is estimated to become the highest revenue contributor, with revenue increasing from **$12 bn in 2022 to $19 bn in 2027**.

Yearly ARPU (In US Dollars)



- As 4G packages gain popularity and 4G coverage expands, yearly data ARPU is projected to increase.
- Yearly voice ARPU will decline due to migration to OTT voice applications.

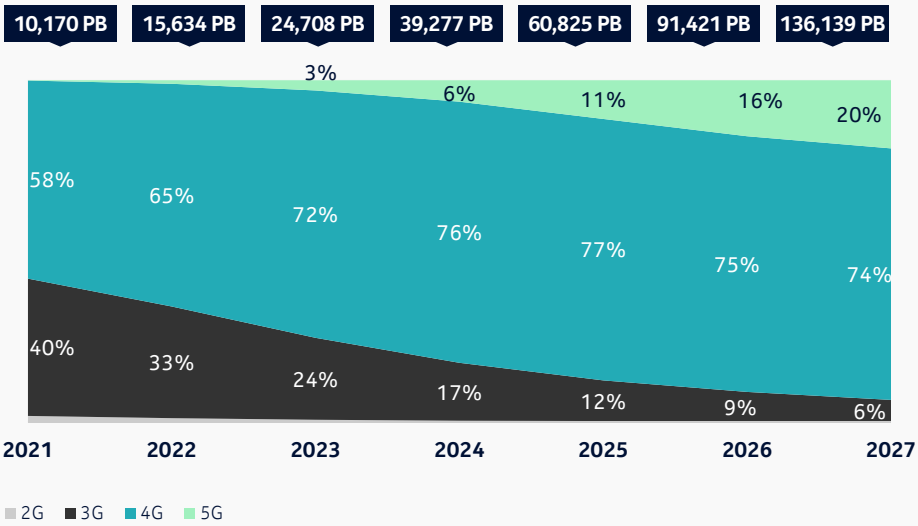
Top 5 countries in the Central East West Africa region

Yearly ARPU (In US Dollars)

Source: GlobalData
Note: ARPU by service type is calculated based on voice/data/messaging revenue divided by total subscribers

Total data traffic is projected to grow by ~9 times from 2022 to 2027; 4G and 5G to drive more than 90% of data traffic by 2027

Forecasted data traffic migration (By technology)



8.7X

Growth in total data traffic from 2022 to 2027

19%

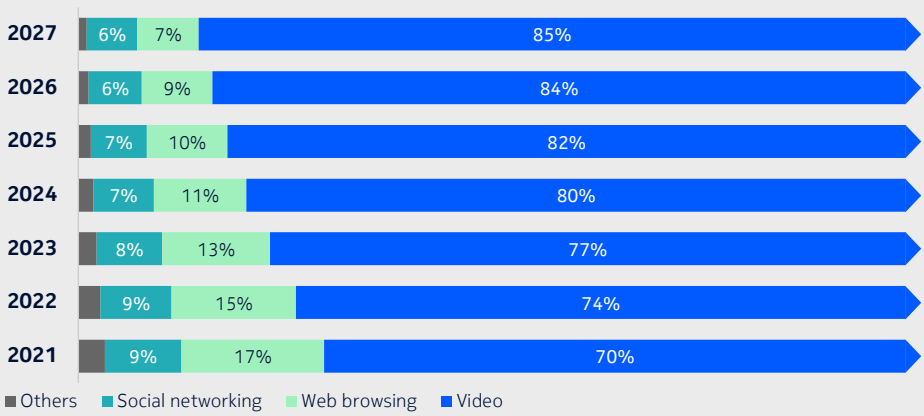
Increase in 5G data traffic market share by 2027 from 2022

Total data traffic (By application)

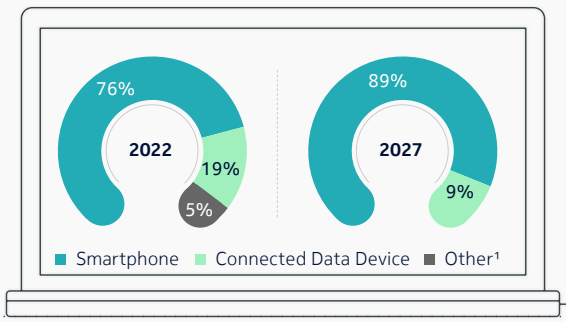
10X

2022 to 2027

Video is the most used service with a projected data traffic share of **85% in 2027**



Total data traffic (By device type)



89%

Smartphone data traffic (2027)

Smartphones are projected to drive **89% of total data traffic by 2027** owing to high smartphone subscriptions **(70% of total subscriptions by 2027)**

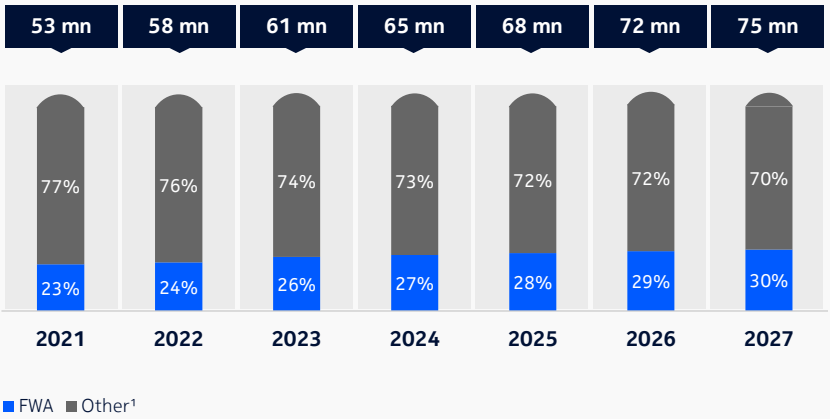
Source: GlobalData

[1]Other Includes feature phone and M2M

Fixed Wireless Access

FWA subscribers are expected to reach 23 mn in the Middle East and Africa region by 2027

Fixed broadband subscribers share by technology across MEA



FWA adoption is estimated to reach

23 mn (30%)

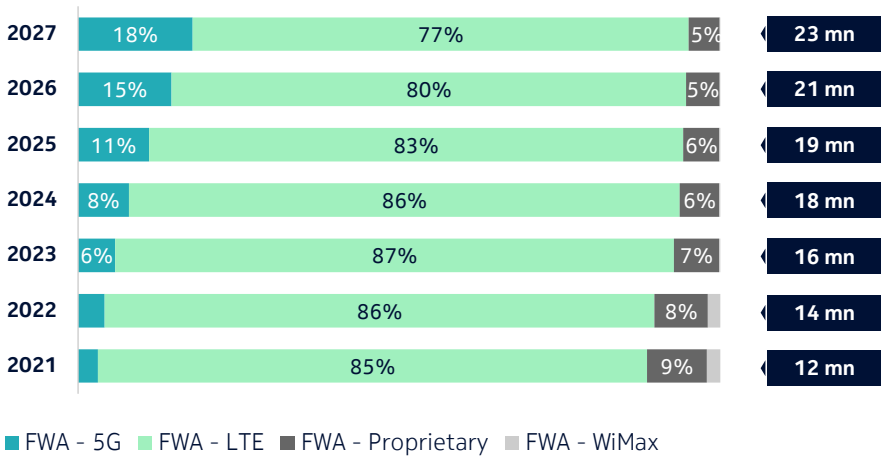
subscribers by 2027, majorly driven by Southern Africa region countries

FWA subscription split by type of technology across MEA

8.2%

CAGR (2022 to 2027)

FWA LTE is the most used service with a subscriber share of **86%** in 2022



- FWA 5G subscription is projected to increase gradually and accounts for **18% of total FWA subscriptions in MEA by 2027,** FWA 5G will grow at a CAGR of **48% between 2022-2027**.
- The future of FWA rests on certain factors like 5G network rollout pace, spectrum availability and reframing, and the marketing and pricing strategies of operators. There is a significant opportunity for operators to drive incremental revenues through FWA.

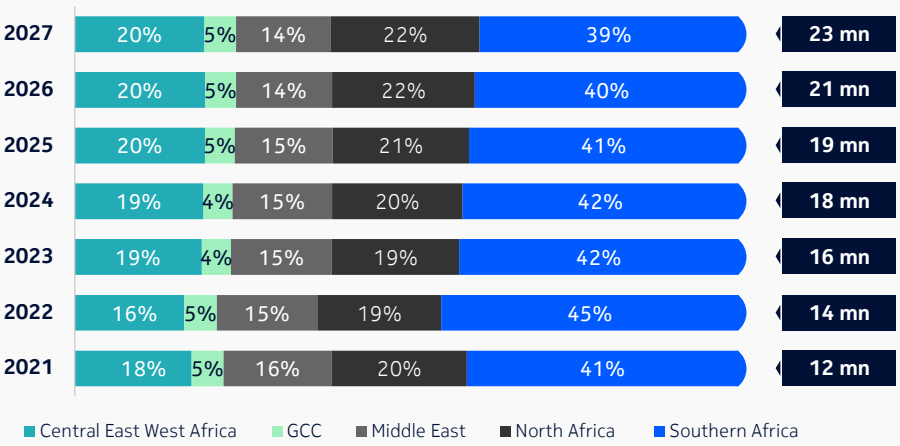
Source: Omdia

[1]Other includes DSL, Fiber, Cable Modem

Note: Totals may not add up or exceeds due to rounding

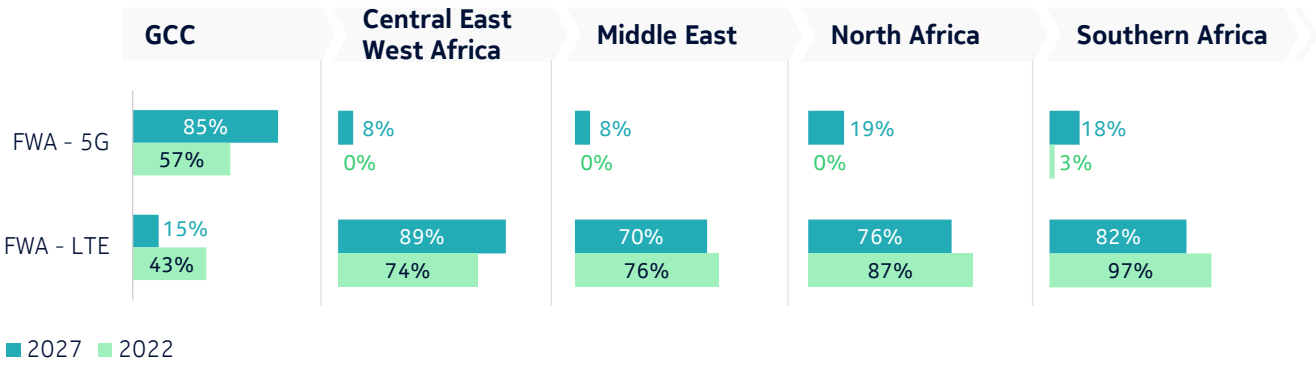
Southern Africa dominates MEA region FWA market with 45% share in 2022

FWA subscription by region



Countries are working towards expanding the reach of fixed broadband infrastructure, majorly driven by private sector players, though there is substantial support by state towards creating a digital transformation

FWA 5G and LTE subscription by region



- Countries in the Middle East and Africa region are working to extend the reach of fixed broadband infrastructure, which will supplement the reach already achieved by mobile networks.
- GCC is dominating the MEA region for 5G FWA subscriptions whereas other regions are more focused on FWA LTE.

Source: Omdia

Note: Totals may not add up or exceeds due to rounding

Sustainability

Nokia's sustainability framework is aligned with the United Nations Sustainable Development Goals (SDG)

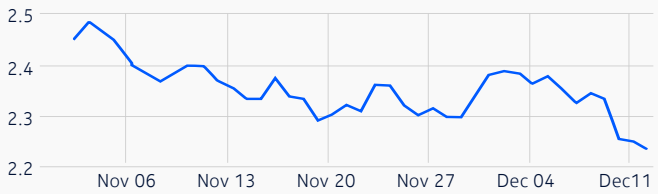
> "There is no green without digital. Only **30%** of the world's economy is currently digitalized, and we must now work to connect the remaining **70%** to ensure the world can reach net zero. 5G and related technologies play a critical role in making other industries more sustainable. At the same time, the ICT industry needs to minimize its footprint and accelerate the use of green electricity".
>
> **Pekka Lundmark**
> Nokia CEO and President

80% of network energy consumed by RAN

Energy cost is between **15% to 30%** of operators OPEX. Although 5G is 10 times more efficient in energy consumption, the continuous growth of mobile data traffic drives up operator's power bill.

Network Optimization helps in Energy Saving and OPEX Reduction

BTS: Energy Consumption (kWh)



Nokia sustainability MEA highlights, 2022

6% to 10%

Decrease in energy consumption in 4G, 5G, and legacy networks with the help of **Nokia's AI-based SON Eden-Net Energy Saving Module**.

Up to 10%

Reduction in power consumption by adopting **Network Planning and Optimization** service that helped also in assuring optimum network performance.

570 tons

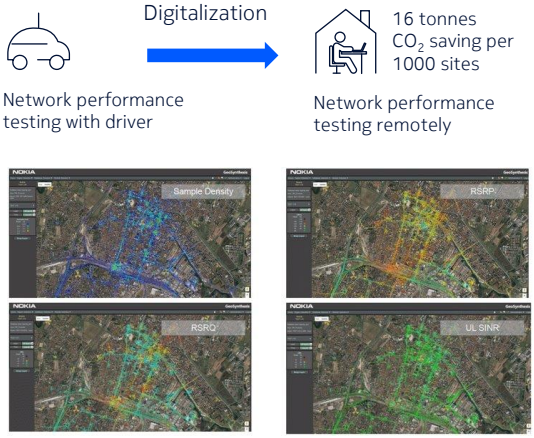
Annual reduction in Co_2 emission through **HW evolution** and introduction of **new baseband plugin card**.

5 to 10%

Energy saving **with RAN SW Features** such as Intelligent switch-off of unused resources with Micro DTX, Cell switch off, MIMO muting and Deep sleep modes.

158 tonnes

Reduce Co_2 emissions by encouraging driverless site acceptances, which is 2.2 mn miles approximately.



Source: Nokia Intelligence (Based on Nokia's footprint in Middle East and Africa)

Reasons to remove the drive tests for field performance measurement

Enhanced Filed Performance Validation, EFPV measures network performance through data collected centrally from subscriber equipment such as smartphones wherever they are in the network area — including indoors. While completely anonymous to protect the privacy of end-users, EFPV provides more precise and comprehensive data from the subscriber experience perspective so that network performance decisions can be taken with more accuracy and confidence.

Complete view on network performance

Drive tests provide only a snapshot of network performance along the drive route, which gives you fragmented picture of the network performance in a specific place and time. EFPV captures a comprehensive data set that reflects the real user experience over the entire coverage area, including indoors and outdoors, based on the data of thousands of user devices instead of just one.

Reach your target network performance faster

Drive tests are resource-intensive to plan and carry out. EFPV accelerates the time to insight, issue resolution, and network acceptance since it is 100% automated with centralized data collection that does not require any scheduling. The full automation results in shorter lead time from data collection to reporting. Performance data can be reported 24/7 from the complete coverage area and actionable reports can be created at the frequency you want. You can obtain performance data from all areas of the cell, including parks, railroads, ferries — everywhere where devices and signal coverage are.

Save our planet

Your company has sustainability goals and you're proud that the work you do can make a difference for our planet. Drive tests are an environmental problem that can be solved. Each drive test generates CO_2 emissions. Replacing that drive test with EFPV leads to zero CO2 vehicle emissions, helping reduce the carbon footprint of your business.

Safety on the job

Road safety is essential to the well-being of people, and it also has an economic impact on transport operations. No drive tests means no related road safety risks or accidents for the drive test crew. And by eliminating thousands of drive tests, you can even improve traffic conditions in the communities where you operate. In addition, reducing traffic accidents can impact other important aspects of your business, such as transport and deliveries.

Source: Nokia Intelligence (Based on Nokia's footprint in Middle East and Africa)

Countries in MEA have taken various initiatives and set targets to achieve sustainability goals

Initiatives taken in MEA region

- **Saudi Arabia** - Saudi Arabia's digital regulator Communication & Information Technology Commission CITC, has developed a roadmap called C.I.R.C.L.E. to achieve its objective for sustainability by 2030:
  - **Cutting-Edge Infrastructure** (SDG-9)
  - **Innovation**(SDG-8)
  - **Renewable Energy** (SDG-1 and 13)
  - **Circular Economy** (SDG 9, 12, and 13)
  - **Leading Cities** (SDG 3, 4, 6,11, and 13)
  - **Equality and Inclusion** (SDG-5 and 10)

- **Morocco** - In June 2021, Morocco submitted its revised Nationally Determined Contribution (NDC) to the UNFCCC secretariat. It aimed to reduce greenhouse gas emissions by **45.5% by 2030** against the business-as-usual scenario and set a conditional target of 27.2% greenhouse gas reductions.

- **Egypt** - By 2030, Egypt aims to reduce greenhouse gas (GHGs) by **10%** from the energy sector, including oil and gas.

- **Kenya** - Kenya launches the "Kenya Carbon Emission Reduction Tool (KCERT) 2050" to mitigate climate change. Kenya is aiming to reduce greenhouse gas emissions by **32%** in the updated NDC compared to **30%** in the previous version.

- **South Africa** - **68% of South African companies** have incorporated sustainable development goals in their strategies and reporting processes. This will help support the 2030 agenda across all governments and society.

Trends in MEA on sustainability

- In 2021, the green data center market size in the Middle East and Africa was valued at **US$690 mn** and is projected to reach **US$1,580 mn** by 2027, with a CAGR of **14.8%** between 2021-2027.

- In MEA companies' carbon neutrality targets for scopes 1 and 2 of SDG are set mostly for implementation before 2050.

Source: ICT AND Sustainability in Saudi Arabia, ndcpartnership, Egypt's NDC, Kenyanews, South Africa's implementation of the 2030 agenda for sustainable development, Arizton

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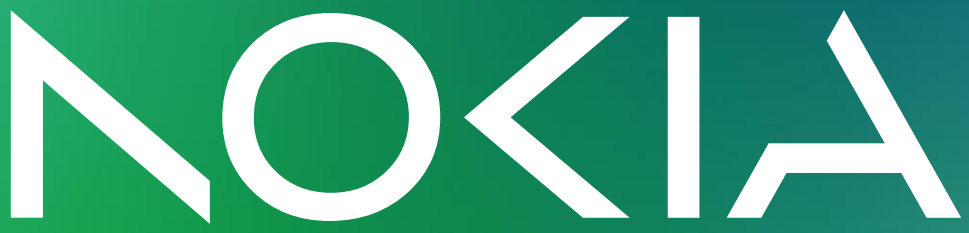

At Nokia, we create technology that helps the world act together.

As a B2B technology innovation leader, we are pioneering the future where networks meet cloud to realize the full potential of digital in every industry.

Through networks that sense, think and act, we work with our customers and partners to create the digital services and applications of the future.