MENA 5G Roadmap

Meeting with members

July 23rd 2020

GSMA

GSMA Antitrust Policy

- Anti-trust law prohibits (i) agreements (written or implicit) between competitors which may negatively impact consumers or competitors and (ii) sharing of confidential information
- All GMSA participants **must** abide by the following rules:

✓**DO** clearly identify the positive purpose of each project and follow it

✓**DO** consult with legal in areas where you are unsure

➢**DON'T** enter into agreements that restrict other parties' actions or creates barriers to market entry

➢**DON'T** discuss or exchange information on pricing, business plans, or any other confidential or commercially sensitive data

Introduction

Mohamed Abbes

Public Policy Director

GSMA

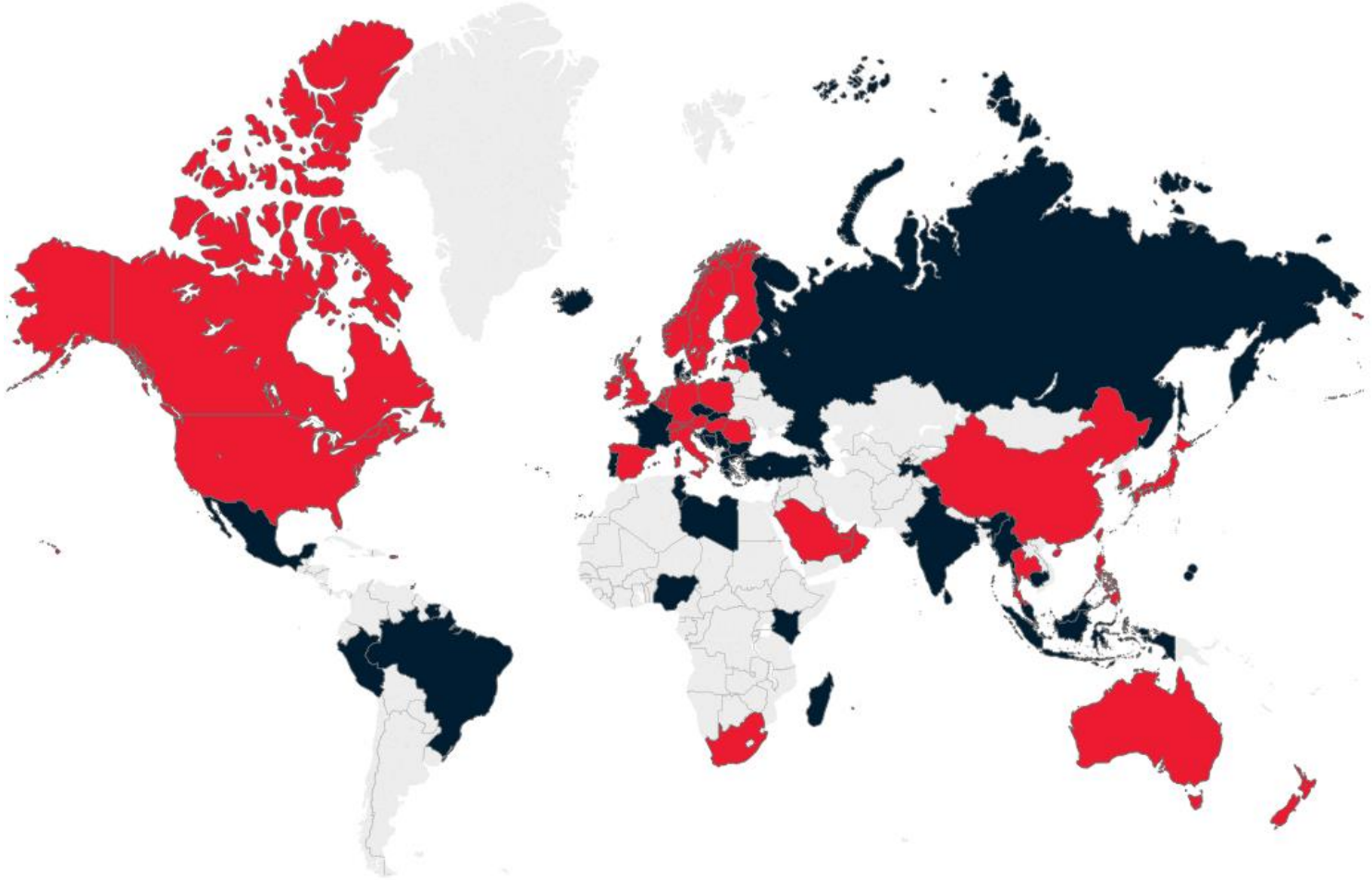
GSMA in The MENA Region

- **Jawad Abbasi, Head of Region**
  - Jordan & UAE
- **Mohamed Abbes, Public Policy Director**
  - Tunisia
- **Amr Hashem, Technology Director**
  - Egypt
- **Rola Osseiran, SM Marketing MENA & SSA**
  - Lebanon & UAE
- **Quincy D'Silva, Business Operations Manager**
  - UAE

- **25 countries**
- **600 million population**
- **63% Unique Mobile Subscribers**
- **33.6% of connections are 4G**
- **700k 5G connections (0.11%)**

https://data.gsmaintelligence.com/

GSMAi data on Commercial 5G (current and future) based on information collected from members



Planned commercial 5G network

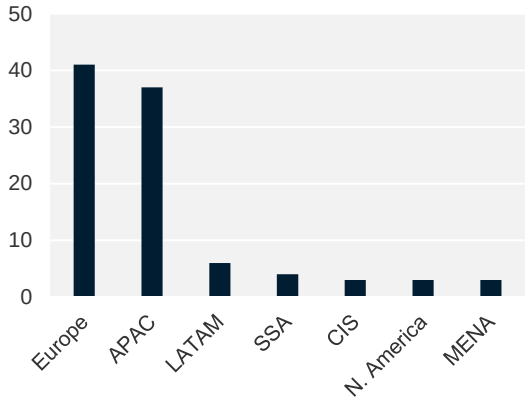
Live commercial 5G network

5G Launches data

As of Q2 2020:

- 5G was commercially available from 87 operators
- Another 84 operators had announced plans to launch mobile 5G

Launches by Region



Data correct to 30th June 2020
For updates, see gsmaintelligence.com

The 5G Roadmap in MENA

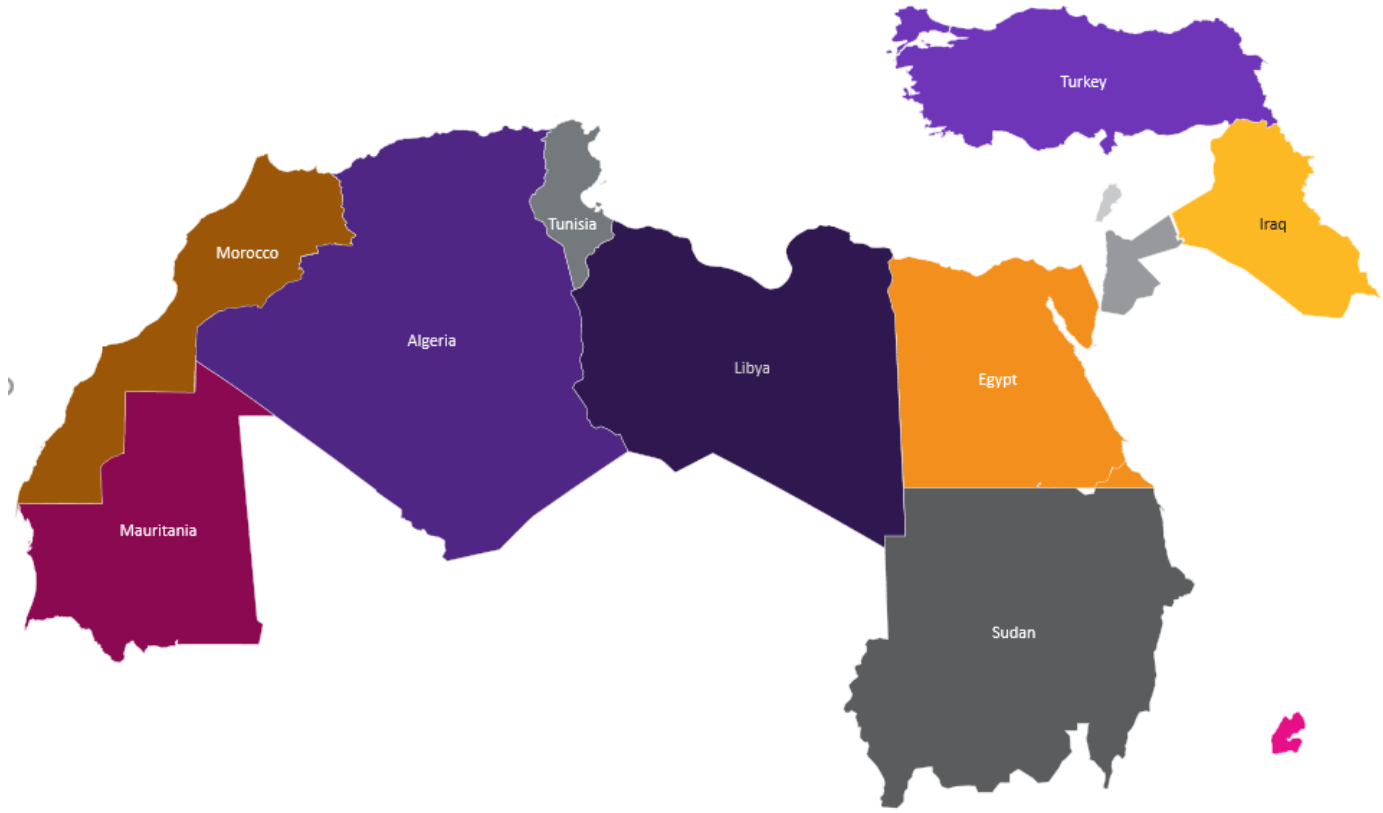
- Provide a report to inform and educate regulators on the current position of 5G spectrum awards and give recommendations on how these should be carried out
- The report is not intended to be a detailed process for every country. Instead, it is to set out the following:
  - Details of which spectrum is intended for 5G use in MENA.
  - International best practice in awarding 5G spectrum.
  - A categorisation of countries based on the current state of awards so the GSMA can identify which countries are most advanced in their plans for 5G release, and which suffer from significant constraints on release of spectrum.
  - An overview of how spectrum should be released, including details of the identification, clearance, award and assignment stages.

The Report

Val Jervis | Tim Miller

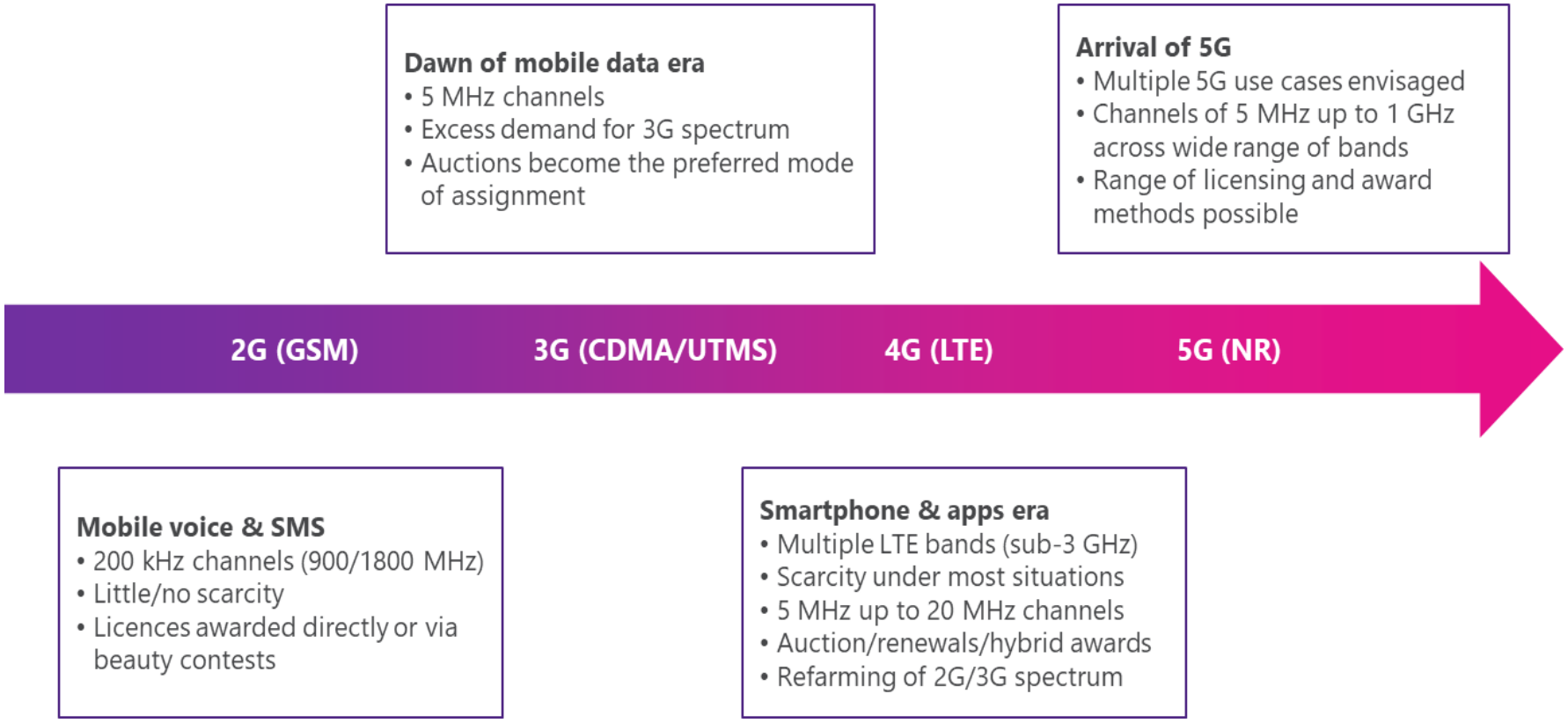
Plum Consulting

Countries on the study



Data provided by GSMAi, country regulators and operators

Evolution of mobile generations and changes to spectrum management approaches



4G will have a key role in the 5G era as well, coexisting alongside 5G into the 2030s.

5G Generic Roadmap

- Identification of spectrum
- Spectrum clearance
- Technology definition and restrictions
- Spectrum valuation
- Award design, including bandwidth and obligations
- Award implementation

Roadmap Steps

Step 1
Identify spectrum

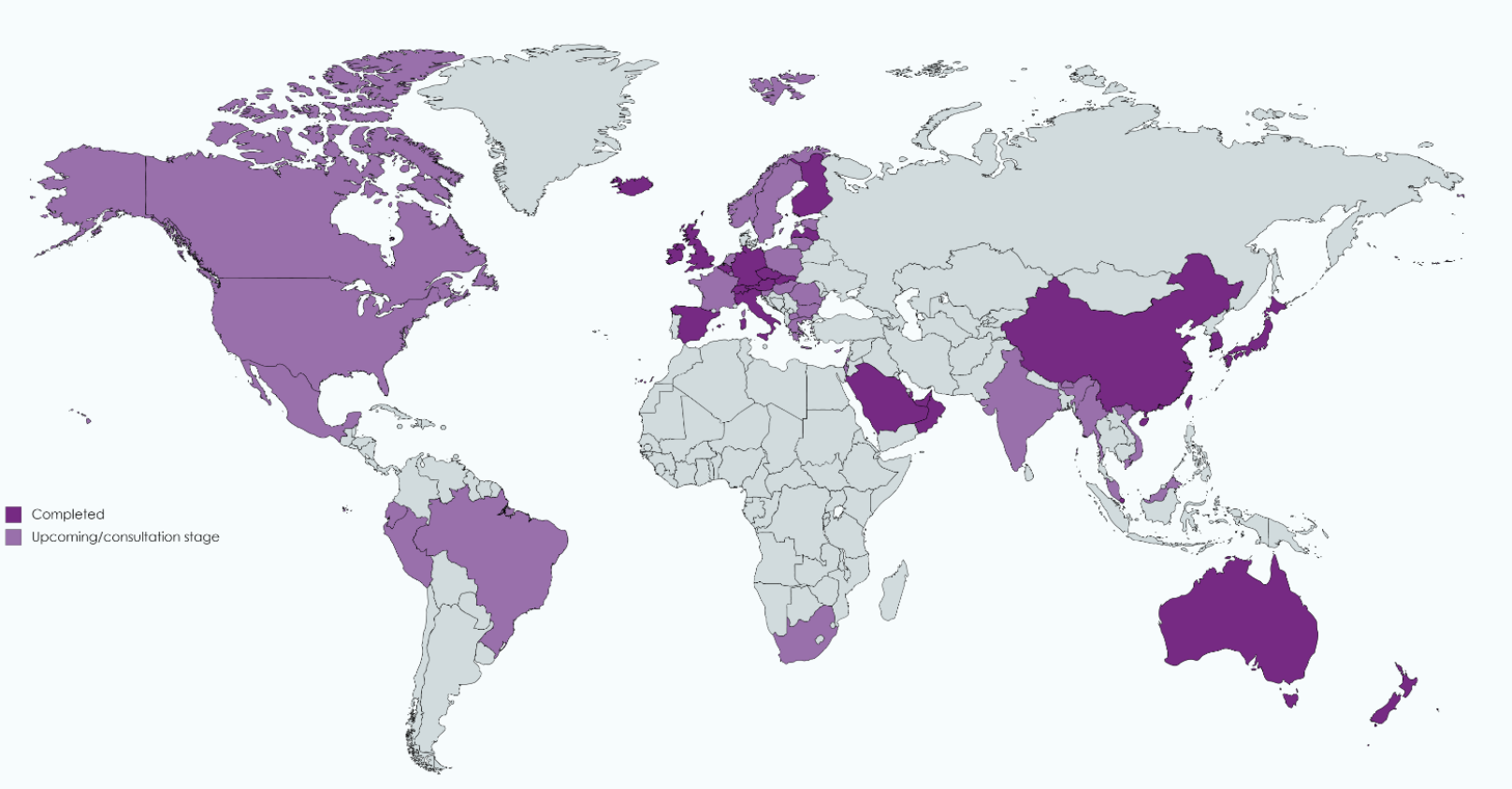
Key frequency bands 700, 3500 MHz (C-band) and 26 GHz.
Depending on existing use potential to identify other bands such as 2300 and 2600 MHz.
Approach adopted in Gulf countries where 5G commercial launches in 2019

Country	5G frequency bands (MHz)
Bahrain	2496 – 2690
Kuwait	3300 – 4200 4400 - 5000
Oman	3300 - 3800
Qatar	3300 -3800

Country	5G frequency bands (MHz)
Saudi Arabia	2300 – 2400 2496 – 2690 3300 - 4200
UAE	3300 - 3800

Source: Global mobile Suppliers Association

3.5 GHz Range example



Internationally, more than 20 countries have assigned the C-band for 5G to date; many more are planning to do so in 2020/21

Roadmap Steps

Step 2
Spectrum clearance

- Essential to understand incumbent use and potential to refarm bands and associated timescales for release.
- Will vary depending on incumbents and specifics such as density of users, geographic location, impact on services and users, potential sharing with 5G.
- May require licences to be terminated and existing users and uses to be removed or provided using alternative frequencies or technologies.
- Possibility of geographic sharing if incumbent limited use (e.g. governmental).
- Frequencies already assigned to MNOs that support 4G and 5G can potentially be realigned to provide contiguous frequencies.
- May require technology neutral licences.

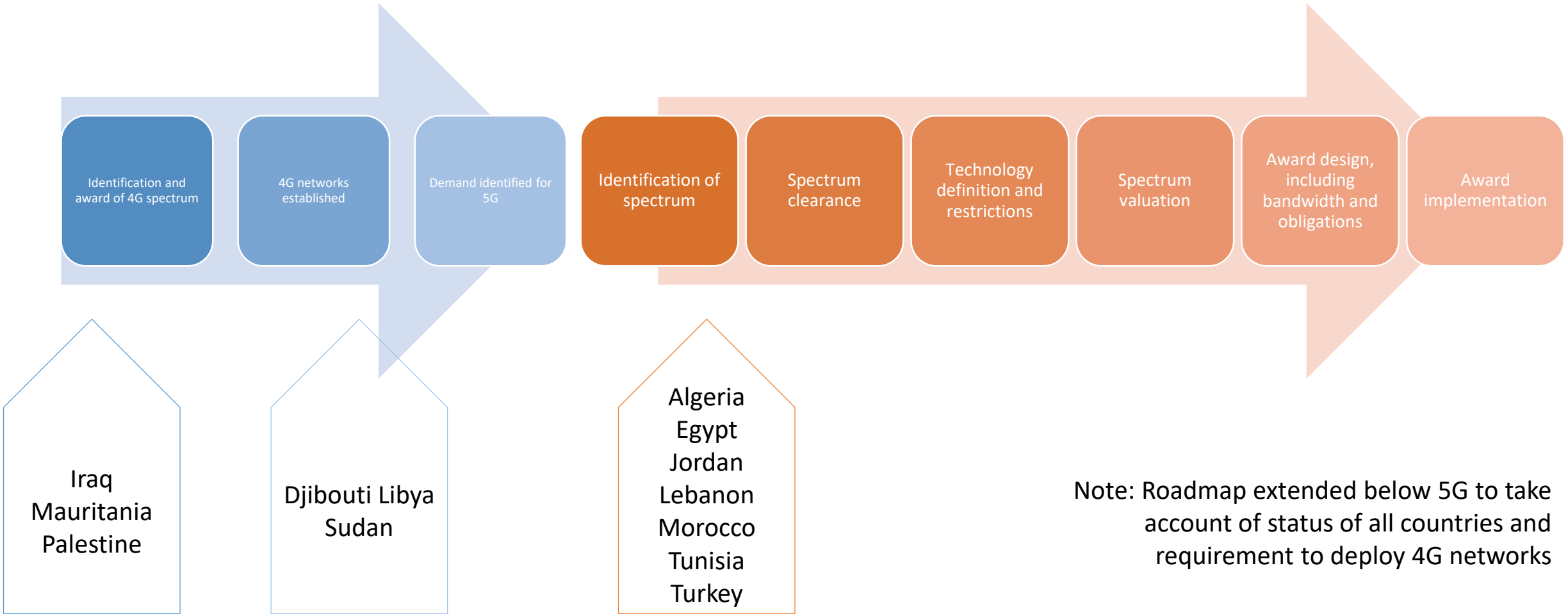
Roadmap Steps

Step 3 Technology definition and restrictions	• Provides necessary information for licence award on any restrictions (e.g. frequency and geographic) and technical conditions (e.g. block edge masks, network synchronisation requirements, transmitter power limits).
Step 4 Spectrum valuation	• Spectrum valuation used to set annual fees and reserve prices if auctioned. • Important to take into account any differences in spectrum being awarded (e.g. geographic or technical limitations on part of a band making it less attractive) • Spectrum valuation should take account of considerable investment needed in networks and impact of high prices and fees on network roll-out, quality of service, availability and end user prices.

Roadmap Steps

Step 5 Award design	• There are 3 main approaches to spectrum award: beauty contest, auction and direct award. Decision needs to be market based, considering policy objectives. • Award design will need to take account the amount of spectrum available and the need for specific conditions such as spectrum caps, sharing, leasing. • Timing of spectrum release may have an impact. May be necessary to hold a number of separate awards such as in Saudi Arabia rather than a single one.
Step 6 Award implementation	• The output of previous steps should result in an Award Information Memorandum and implementation of the award process

Current Roadmap Status



Note: Roadmap extended below 5G to take account of status of all countries and requirement to deploy 4G networks

Based on GSMAi market data, responses from operators, administrations and governments and online services.

Countries on 4G Roadmap

- A number of countries (Iraq, Mauritania, Palestine) apparently not awarded 4G spectrum.
- 4G will continue to play key role in mobile networks as 2G and 3G are phased out and 5G introduced.
- 4G introduction will allow users to experience benefits of higher broadband services and economic benefits accrued to the country.
- These countries should follow the same roadmap but with the emphasis on spectrum and awards for 4G.
- Important existing licences are technology neutral to allow operators to refarm current spectrum for 4G (e.g. 1800 MHz) based on the market and their network and service planning.

Countries on 4G Roadmap

- Djibouti, Libya and Sudan have 4G networks deployed or being deployed.
- In Libya and Sudan demand for 4G forecasted to increase significantly until 2025
- It is probably too early to consider investments in 5G until there is market demand for services that cannot be supported by 4G
- However countries can start considering potential frequency bands for 5G and the likely implications of releasing this spectrum

Countries on 5G Roadmap

- Algeria, Egypt, Jordan, Lebanon, Morocco, Tunisia and Turkey are all considered to be at Step 1 and Step 2 on the roadmap.
- In all these countries the number of 2G and 3G connections are decreasing whilst 4G connections increasing.
- 5G testing and trails underway in many of these countries (e.g. Algeria, Egypt, Morocco and Tunisia.
- In Lebanon one operator planning 5G network.
- GSMA forecasts predict 5G networks available before 2026.

Countries on 5G Roadmap

The situation on spectrum availability varies by country, for example:

- In Jordan the current BWA licences in the 3500 MHz bands will expire at the end of 2022 allowing them to be identified for 5G. The 26 GHz band is used for fixed links and these can be migrated to other bands in coming 2 years. This means the two bands can potentially be awarded by the end of 2022.
- In Tunisia the 700 MHz band is already available since analogue TV switch-off. The 3500 MHz licences have been modified to allow LTE and there is some use of the 26 GHz band for fixed links. There is the potential to award the 700 MHz band now and possibly rearrange the 3500 MHz and 26 GHz bands to release spectrum and ensure contiguous frequencies.

Countries on 5G Roadmap

- It is noted that in Egypt and Turkey there have been awards of spectrum for LTE in bands that could also potentially be used for 5G (700 MHz in Egypt and 800 and 2600 MHz in Turkey). This is not an issue as a range of different bands have been identified for 5G – in particular for the mid-frequencies.
- In Morocco we would recommend that current use of the 800 MHz (CDMA) and 3500 MHz (BWA) bands is examined to determine the potential for releasing the spectrum for 5G if this has not already been undertaken.

All countries now need to complete Steps 1 and 2 on the roadmap and address the next steps to ensure timely release and award of spectrum.

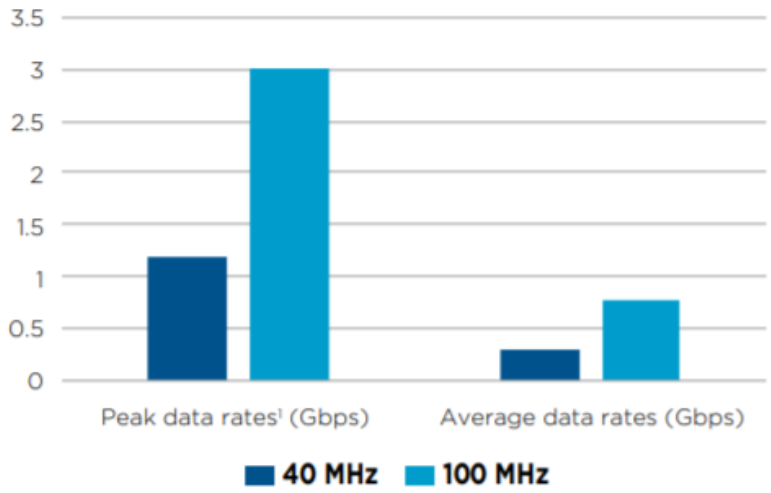
Conclusion

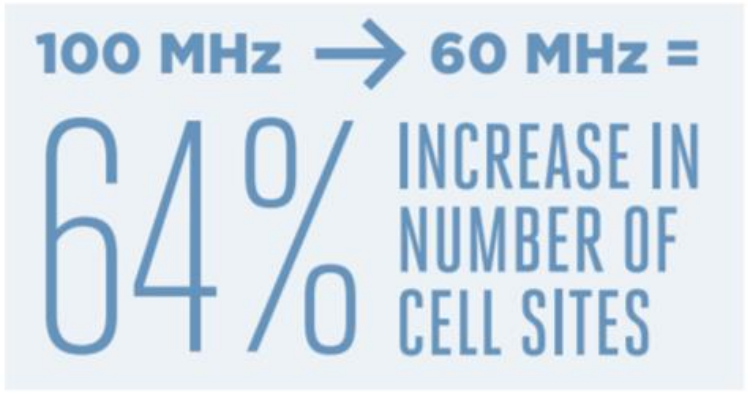
Peng Zhao
Spectrum Senior Director
GSMA

Conclusion: The 5G Roadmap in MENA

Assessment	• A preliminary complete market assessment is necessary • Occupation, market interest and socio-economic benefits to be considered
Timing	• Countries have different timings to make 5G available • Timing depends on 4G development and clearance needs
Availability	• Prioritise available spectrum with wide ecosystem (700 MHz, 3.5 GHz) • Pricing and award approach as key component

Large Contiguous Spectrum is required for 5G





https://www.gsma.com/spectrum/wp-content/uploads/2019/10/3-GHz-in-the-5G-era.pdf

What's next?

Plans for the GSMA to engage

Present

AREGNET annual meeting in September 2020

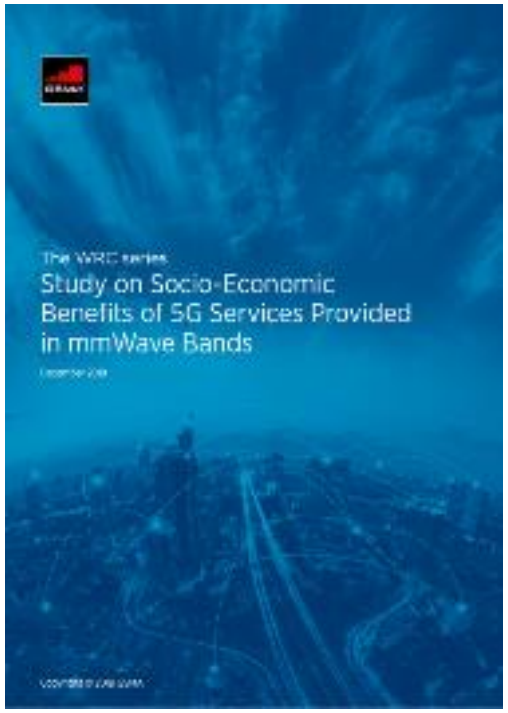
Spread

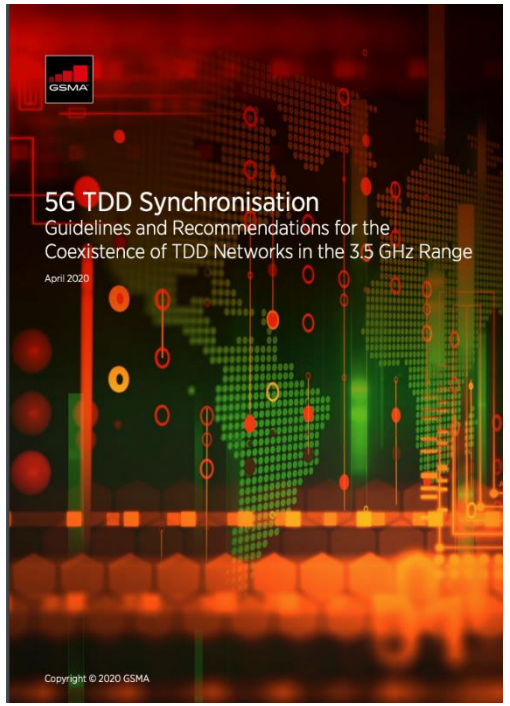
Paper to be published Members and GSMA to use on engagements and social media

Engage

Country specific engagements when opportunities arise

GSMA Studies





https://www.gsma.com/spectrum

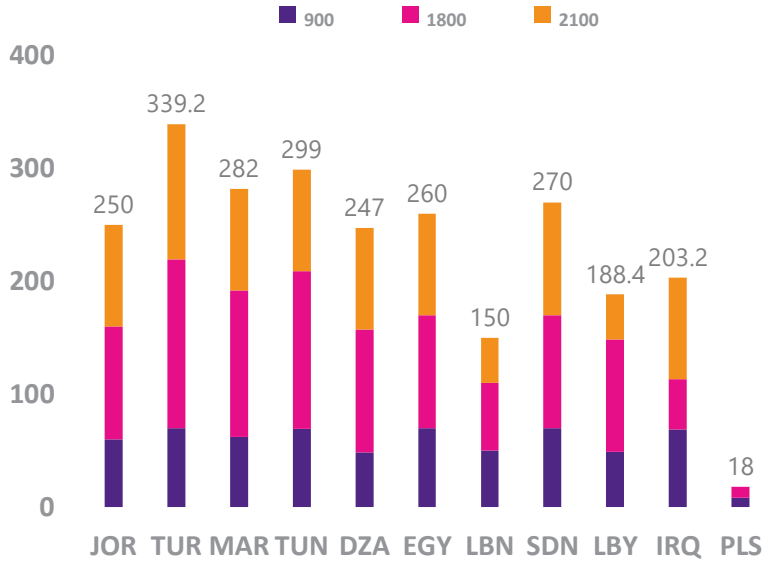
MENA 5G Roadmap

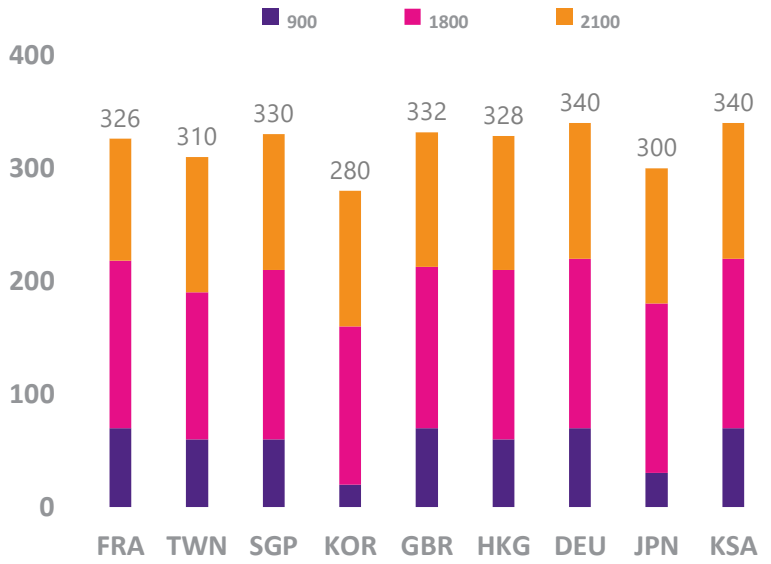
Annex

GSMA

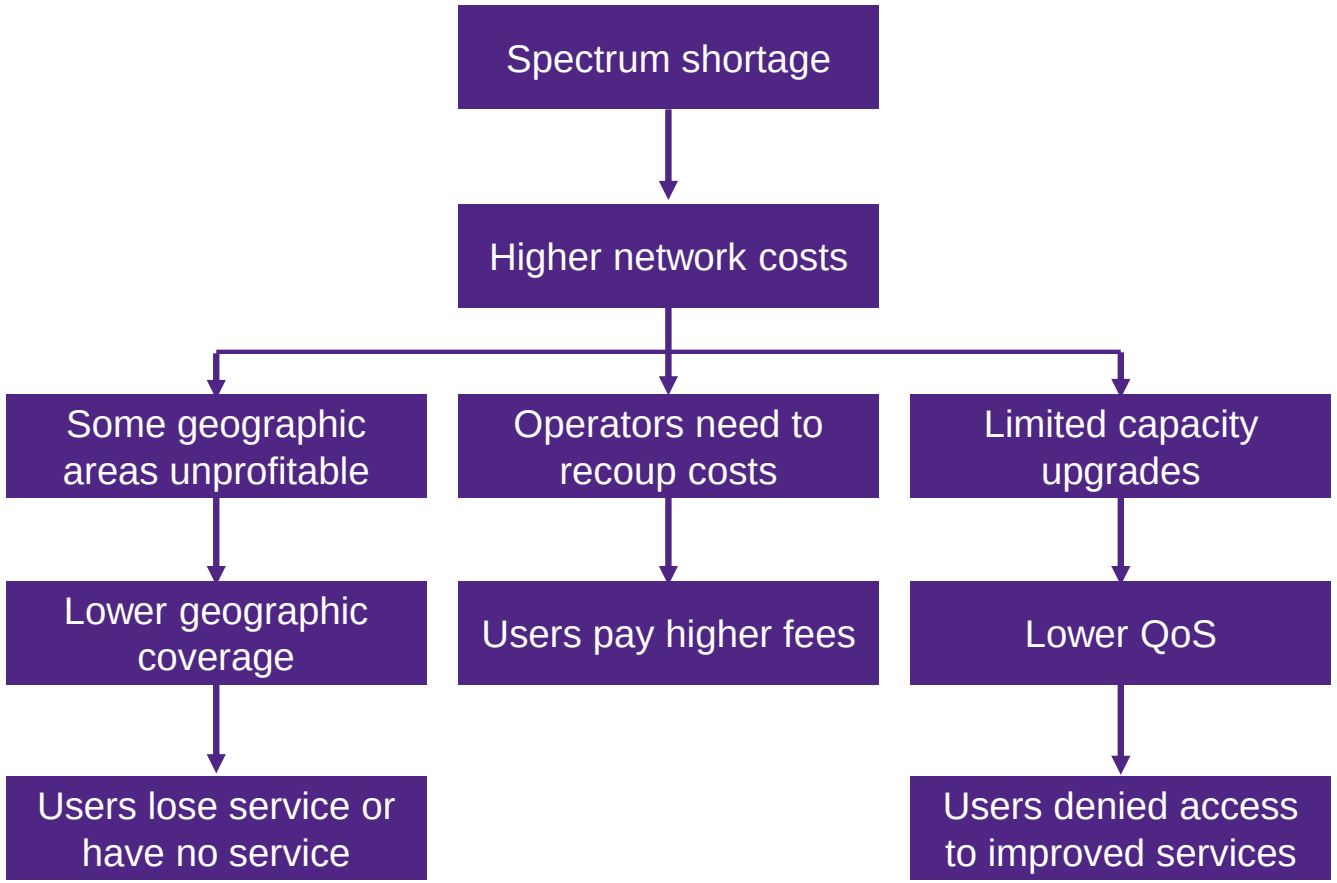
Plum data: Spectrum is needed

Countries with limited spectrum awarded to date should aim to release more frequencies. Many of the countries have made substantially less spectrum available than others.





Impact of spectrum shortages



Example approach – Saudi Arabia

- The Kingdom of Saudi Arabia is one of the first countries in the Middle East region to assign key mid-band spectrum for 5G, with auctions of the 2.3 GHz, 2.6 GHz and 3.5 GHz bands which were completed in early 2019. Low band spectrum (700 MHz and 800 MHz bands) was awarded earlier primarily for 4G but operators can use it for 5G as well as the licences are technology neutral.
- One of the KSA's strategic objectives in the National Transformation Program (NTP) 2020 was to make available more spectrum for the provision of mobile broadband or IMT services. In the last three years the Communications and Information Technology Commission (CITC) has carried out four auctions including existing and new IMT bands, namely:
  - June 2017: 700 MHz and 1800 MHz
  - February 2018: 800 MHz, residual spectrum in 700 MHz and 1800 MHz bands
  - January 2019: 2.3 GHz and 2.6 GHz
  - March 2019: 3.5 GHz
- As a result, operators in the KSA today have access to more than 1000 MHz of licensed spectrum for IMT use in the sub-6 GHz range which is on a par, or higher than, most of the leading countries in Europe, Americas and the Asia Pacific.

Example approach – Saudi Arabia