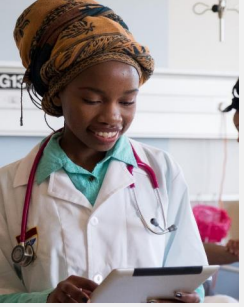
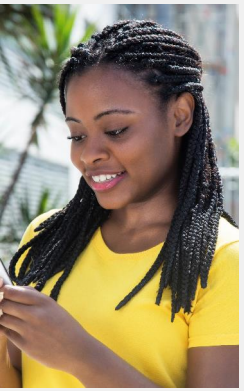
Mobile Connectivity and WRC-23

APT

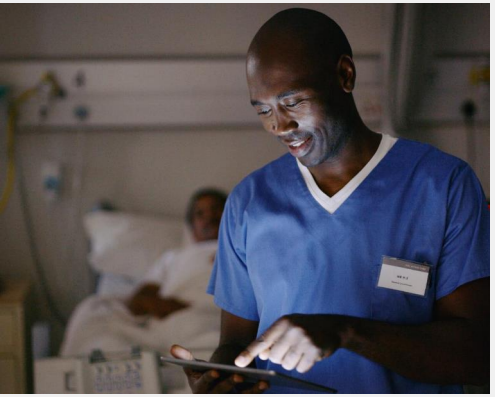
Yishen Chan, GSMA

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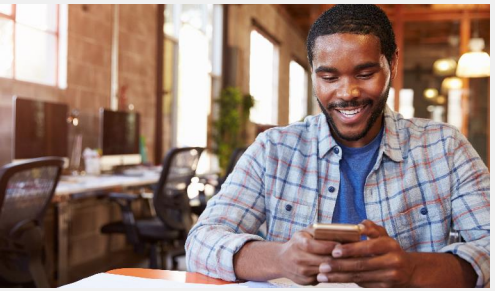










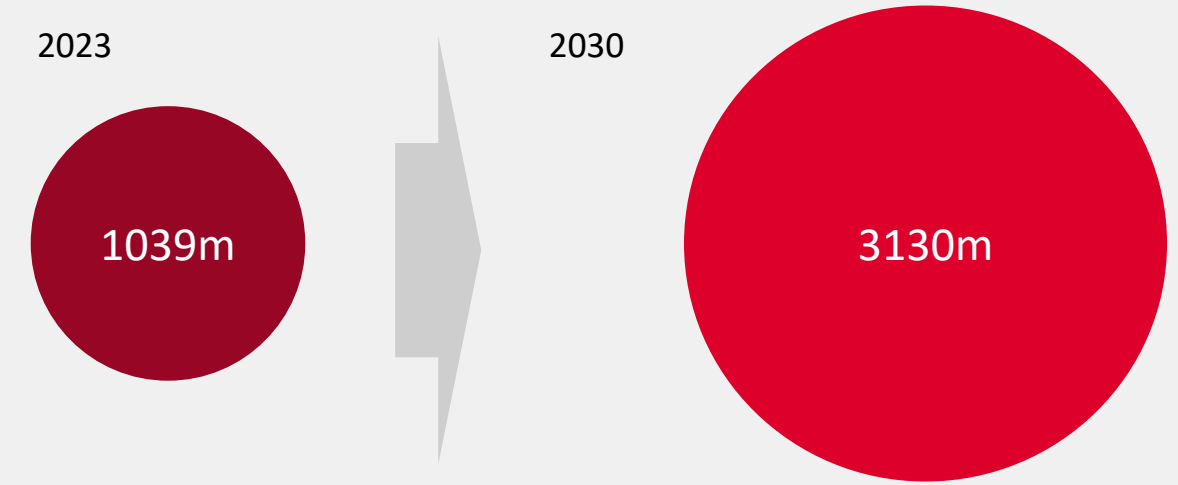


5.4 bn mobile subscribers

1.5 bn 5G connections

As subscribers increase …

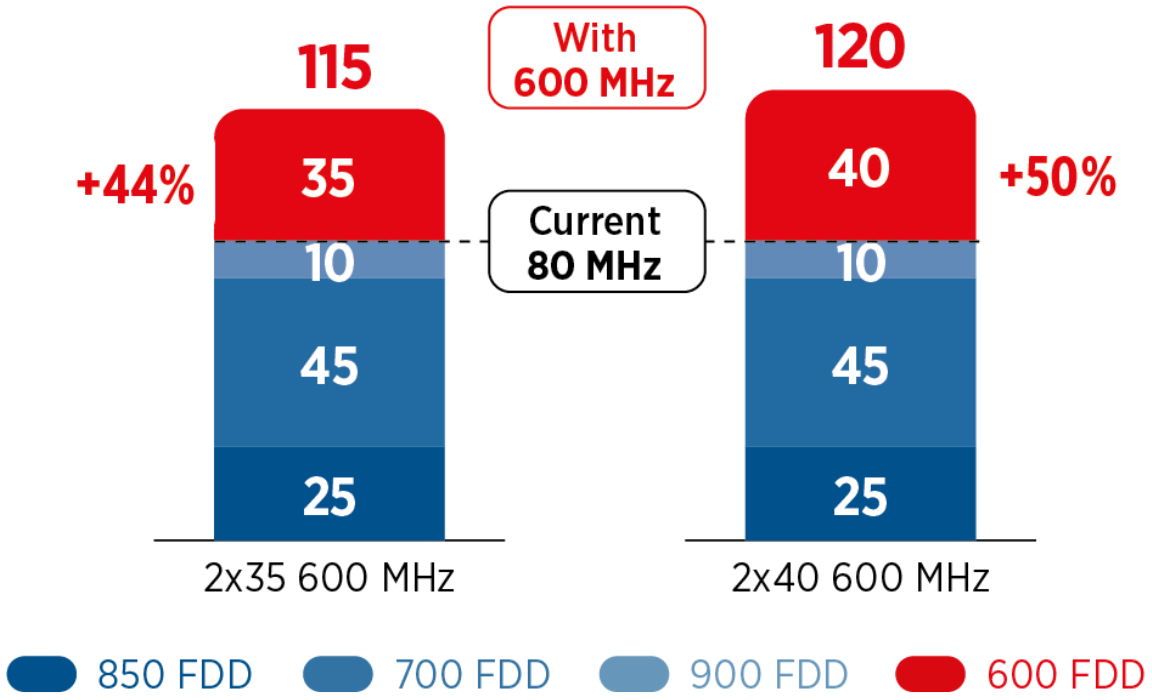
5G needs space to grow



5G Connections in APAC

Why More Low-Band Spectrum?

LatAm and APAC

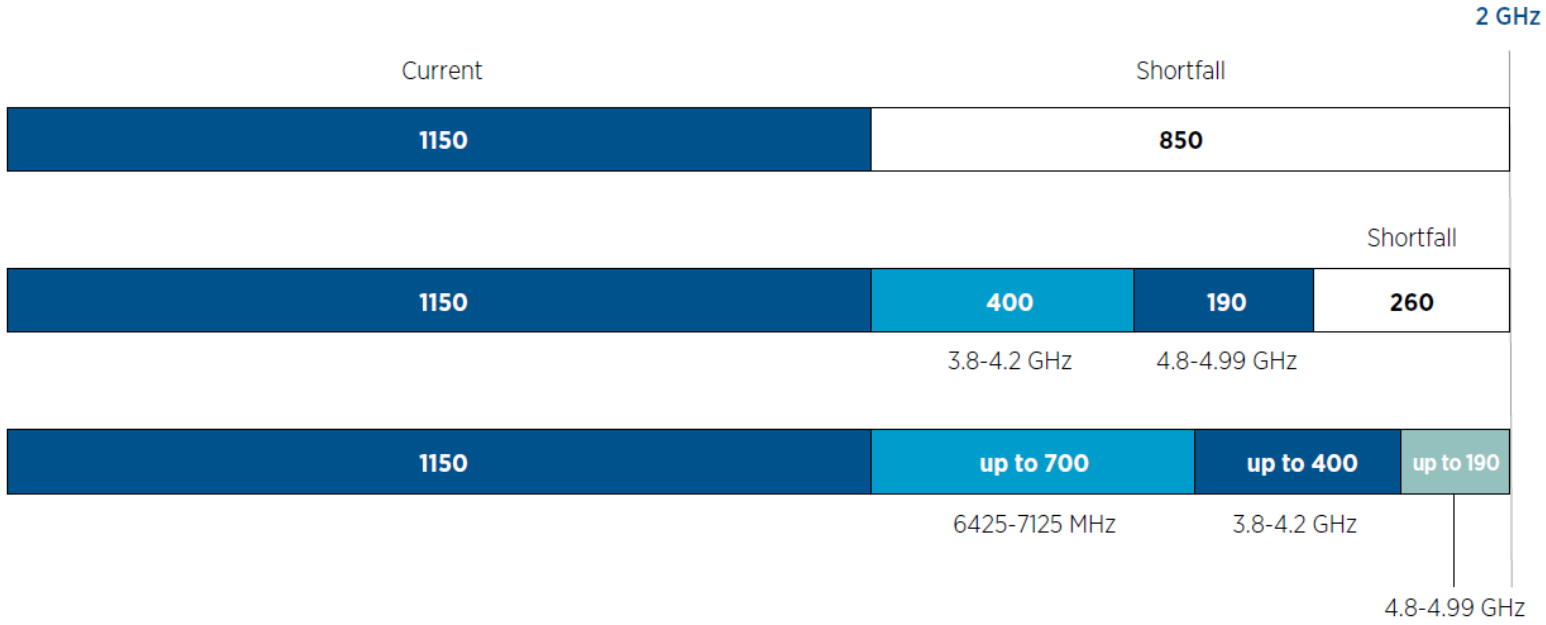


- Poverty reduction
- Education
- Employment
- Health
- Climate change

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Mid-Band Maths





2 GHz

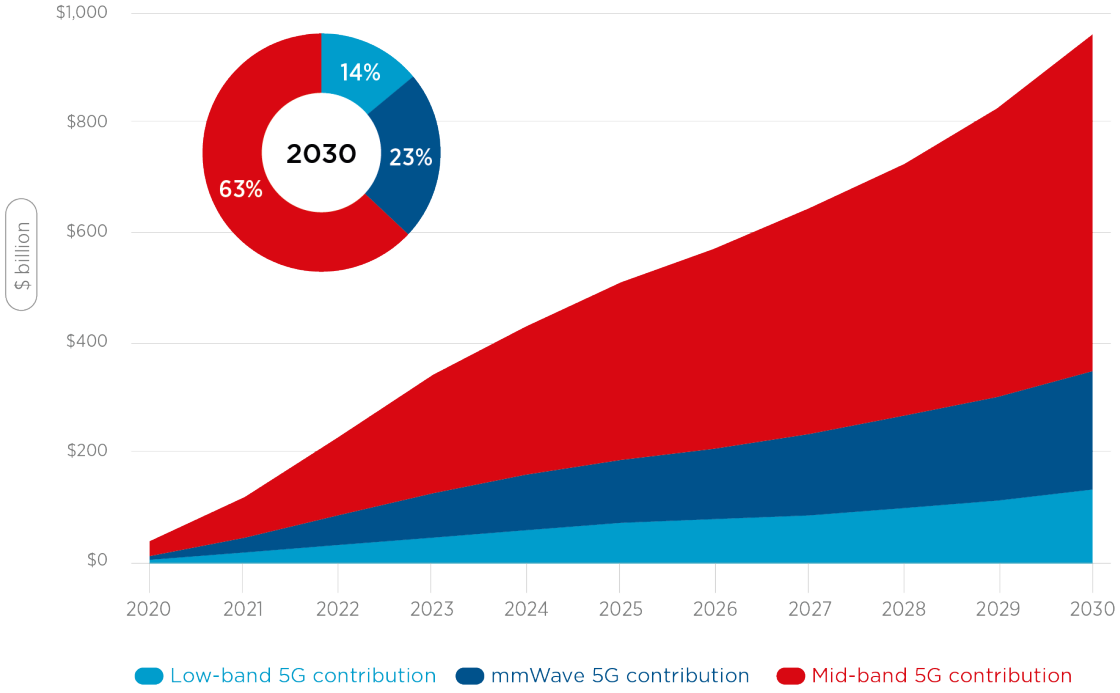
of mid-band is required for 5G by 2030.

This is challenging to achieve without 6 GHz

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Economic Power of 5G

5G CAN IMPACT GLOBAL ECONOMY IN 2030 BY $961BN...



... BUT SPECTRUM CONSTRAINTS RESTRICT VALUE

Optimal Scenario

$961bn

0.68% of GDP

Constrained Scenario

$594bn

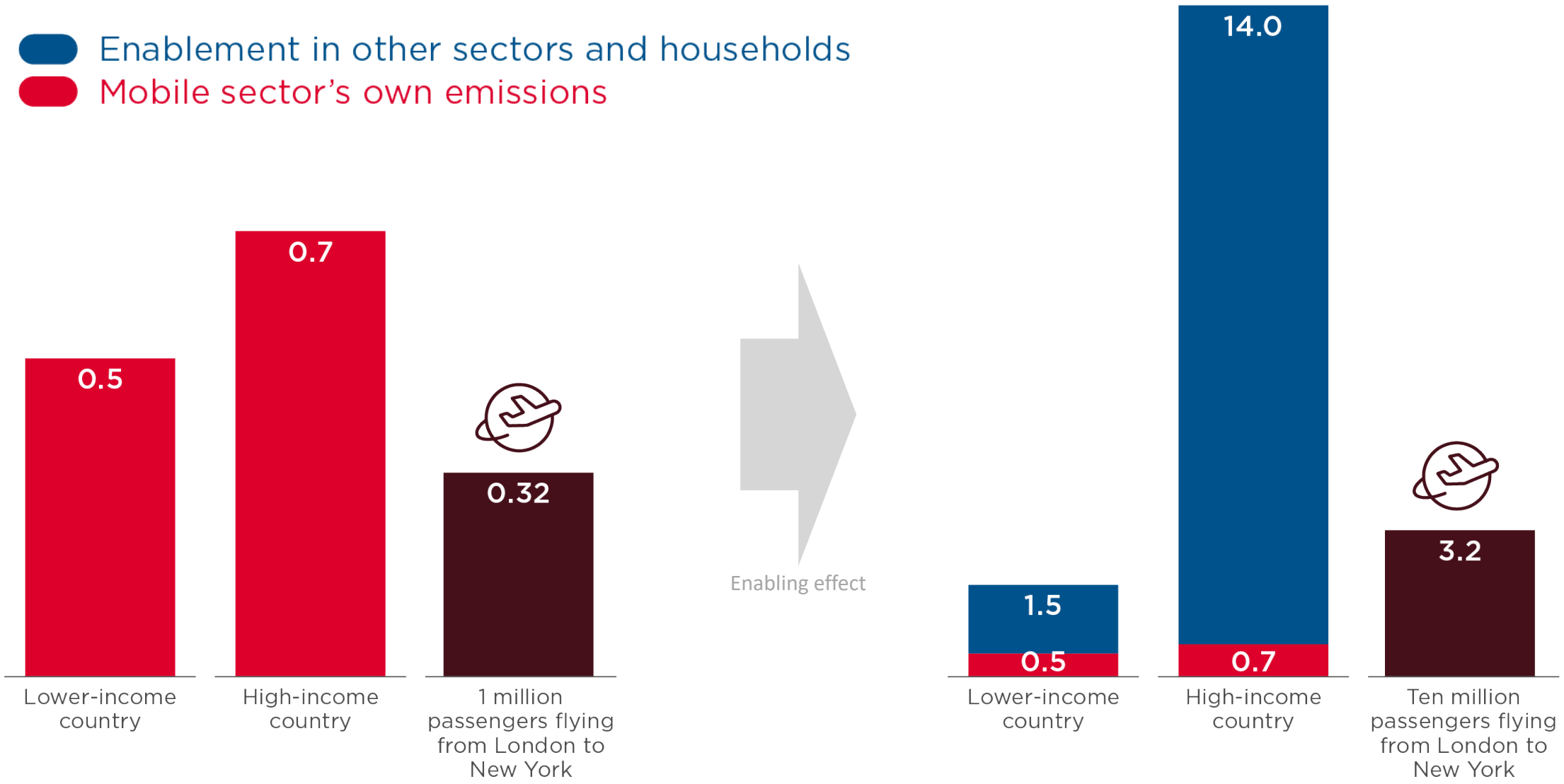
0.42% of GDP

The Socio-Economic Benefits of Mid-band 5G GSMA Intelligence 2022

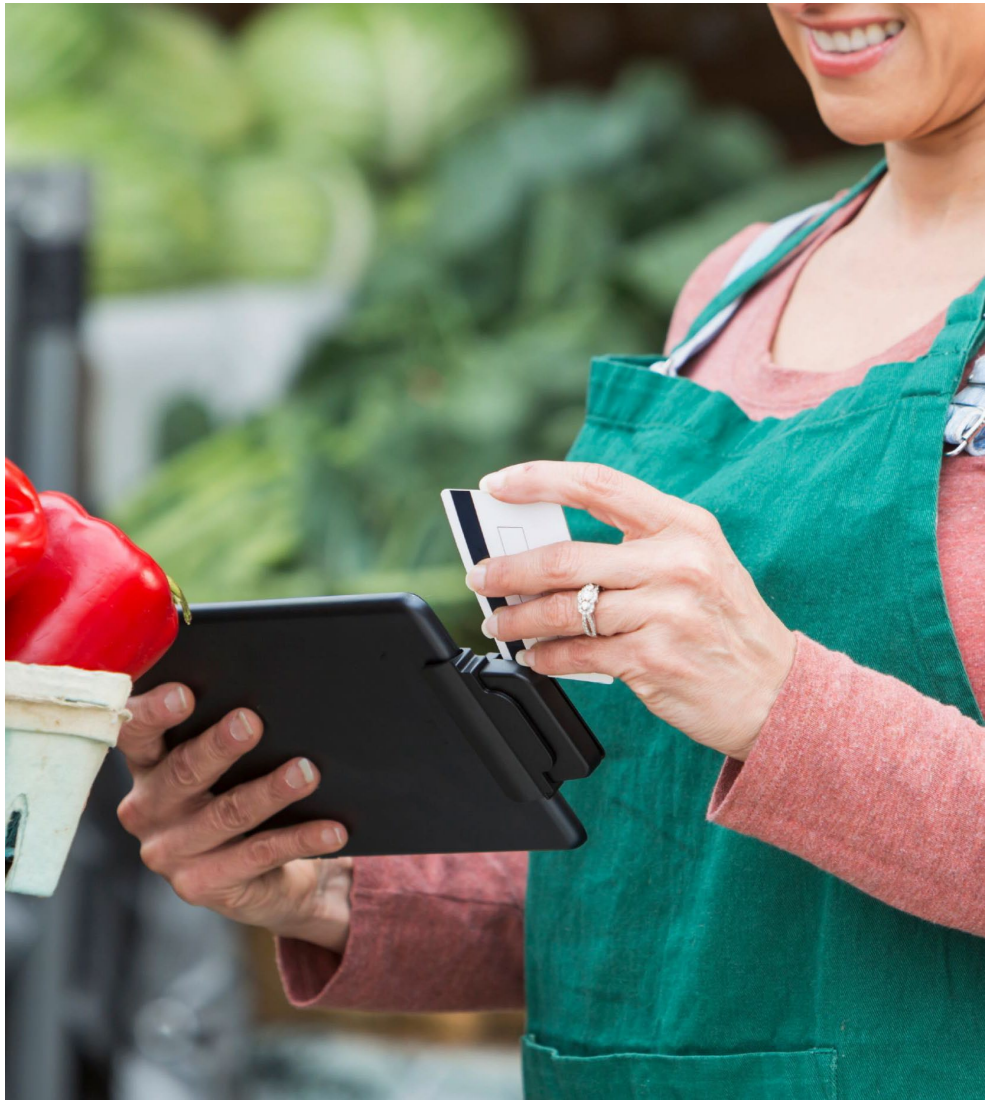
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WRC-23 and Carbon Emissions

Emissions increase with 100 MHz less spectrum



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Digital Equality

Low-band

470-694 MHz

- The GSMA supports a primary mobile allocation in the band 470-694 MHz. This will allow those countries that wish to do so to identify the band, or parts thereof, for IMT.

Harmonisation

3.5 GHz

3.3-3.8 GHz

- The GSMA supports identification of the bands 3.3-3.4 GHz and 3.6-3.8 GHz for IMT.

Expansion

6 GHz

6.425-7.125 GHz

- The GSMA supports identification of the band 6.425-7.125 GHz for IMT to enable ecosystem development and protection of existing services

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For the benefit of all

Mobile means a fairer world. It brings opportunities to prosper, learn, laugh and love, allowing everyone to live their lives to the full.

Global mobile Suppliers Association

Ensuring the ongoing success of IMT

ITU-R CPM23-2 Meeting

GSMA/GSA Lunchtime Seminars

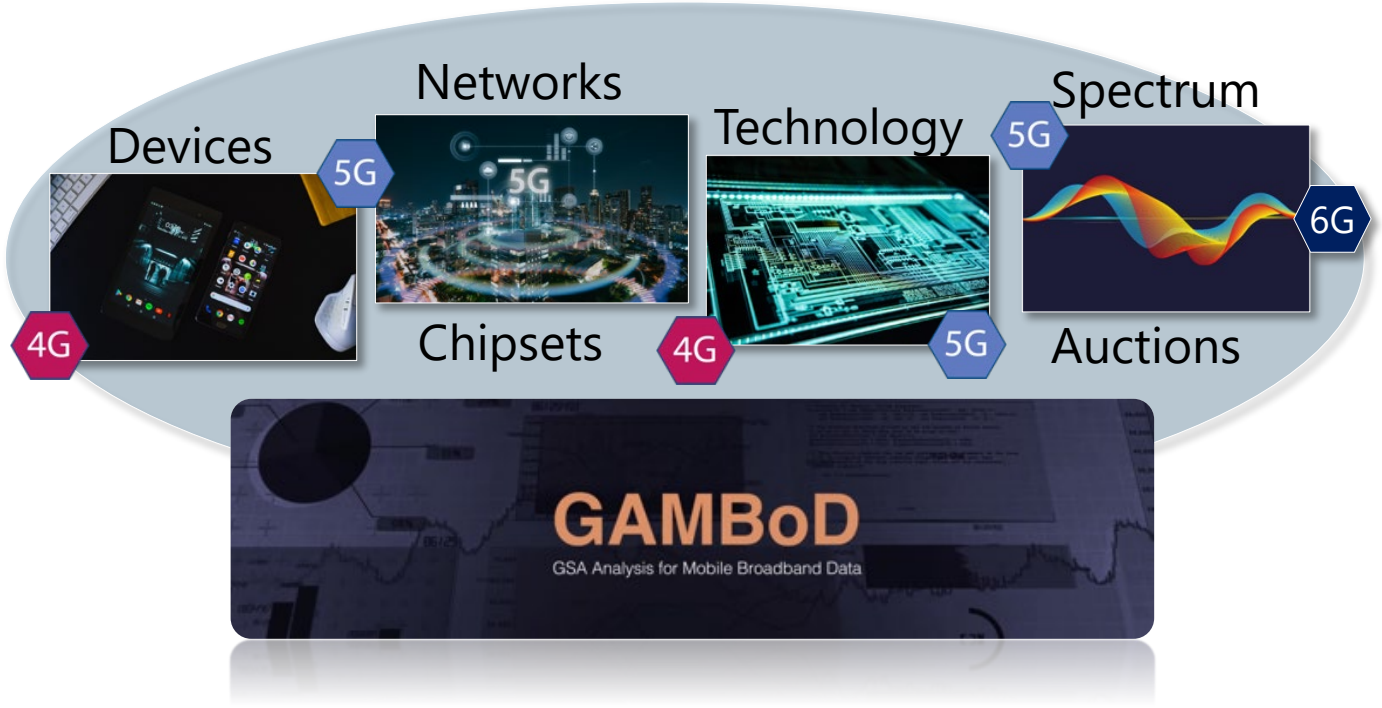
March ‘23

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About GSA

- Representing the global mobile ecosystem since 1998
- Extensive research & database
  - Free industry reports
  - Member reports & GAMBoD Access
- GSA Spectrum Group
  - 185+ participants regionally grouped
  - Advocacy, education and technical support
  - Cooperation with other industry groups such as COAI, CTIA, GSMA, TechUK, etc
- GSA Standards Group
  - 6G-Joint Working Group
- 87 Associates subscribing to GSA data
  - Regulators-Analysts-Operators etc.
- GSA is pleased to partner with GSMA for this event concerning WRC matters. The views expressed in this presentation are those of the GSA.

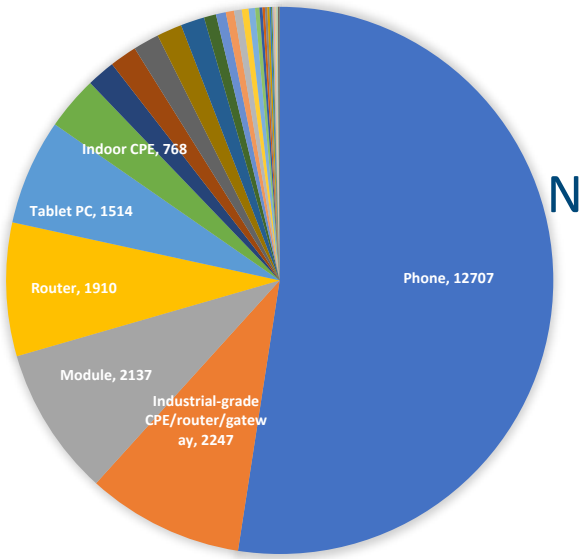




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Continuing to Deliver the Global ITU IMT Vision

24k IMT2020 Devices*



8.4Bn Mobile Subscribers#

x1.06 North America

x1.51 Europe

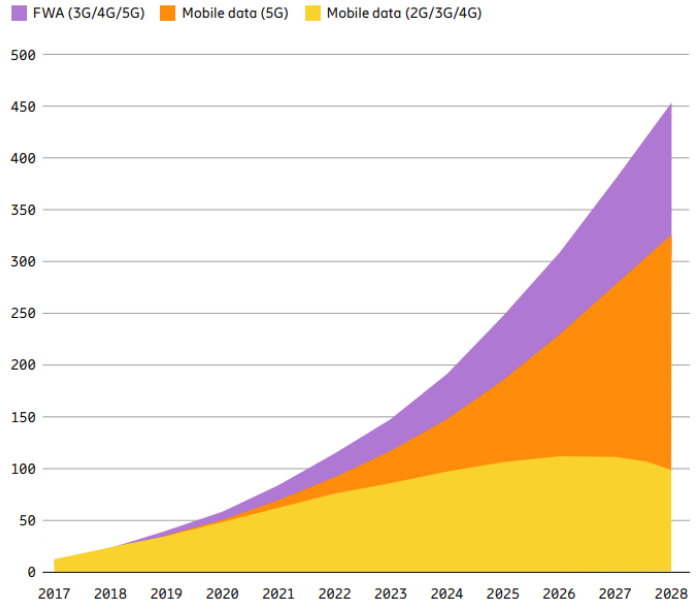
x1.07 Latin America

x0.91 MEA

x1.02 Asia



15GB per month+



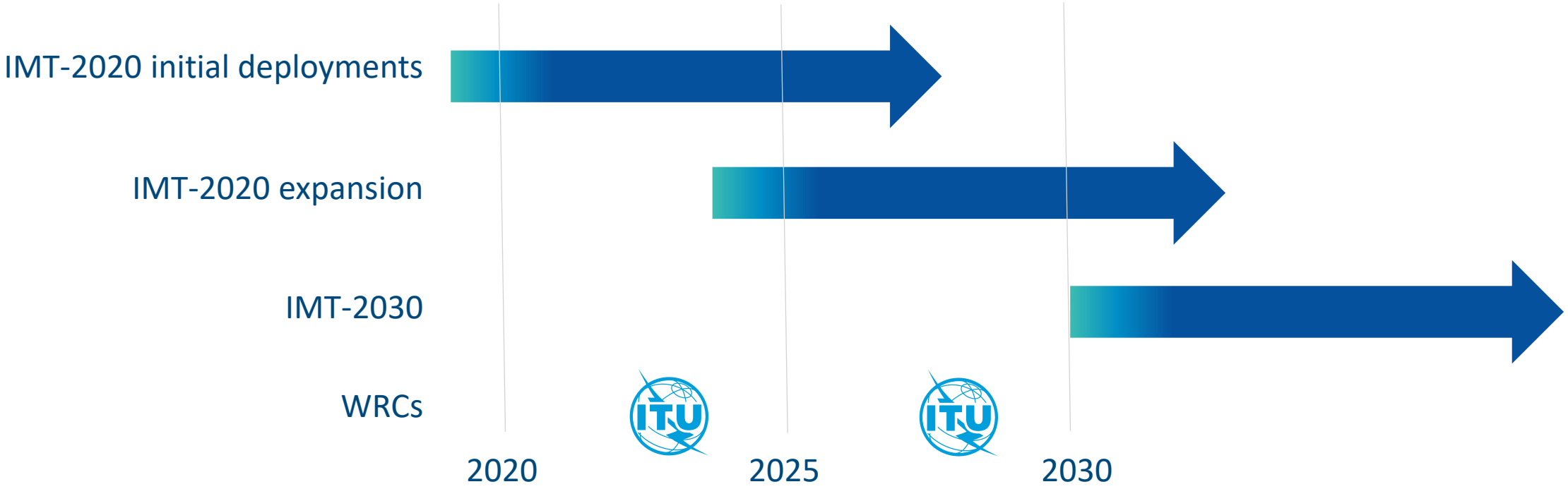
* Source: GSA GAMBoD, March 2023

Source: Ericsson Mobility Report, Nov22. Number of Mobile Subscriptions per region

+ Source: Ericsson Mobility Report, Nov22

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IMT / 3GPP Spectrum 2020-2030

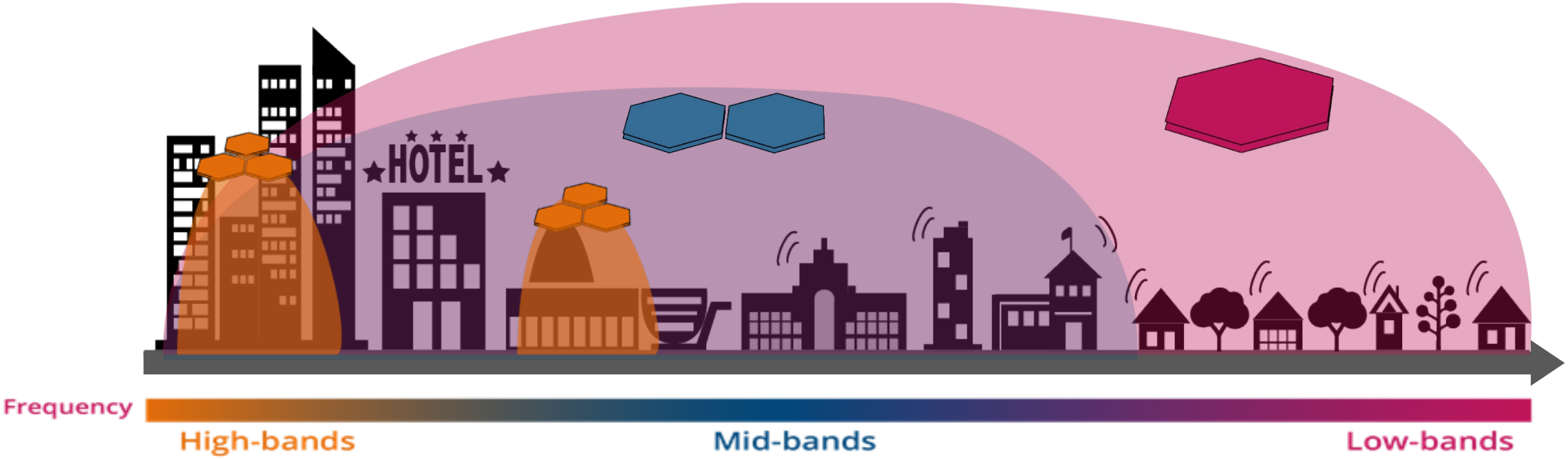


- 5G underway with licensing and roll-outs
- 5G expansion spectrum planning underway in some countries, with a timeframe from 2023/25
- 6G research is accelerating globally, ITU-R planned deliverables (including IMT-2030 framework) and workplan in place to enable IMT-2030/6G standards to be completed by 2030, in cooperation with external organisations such as 3GPP

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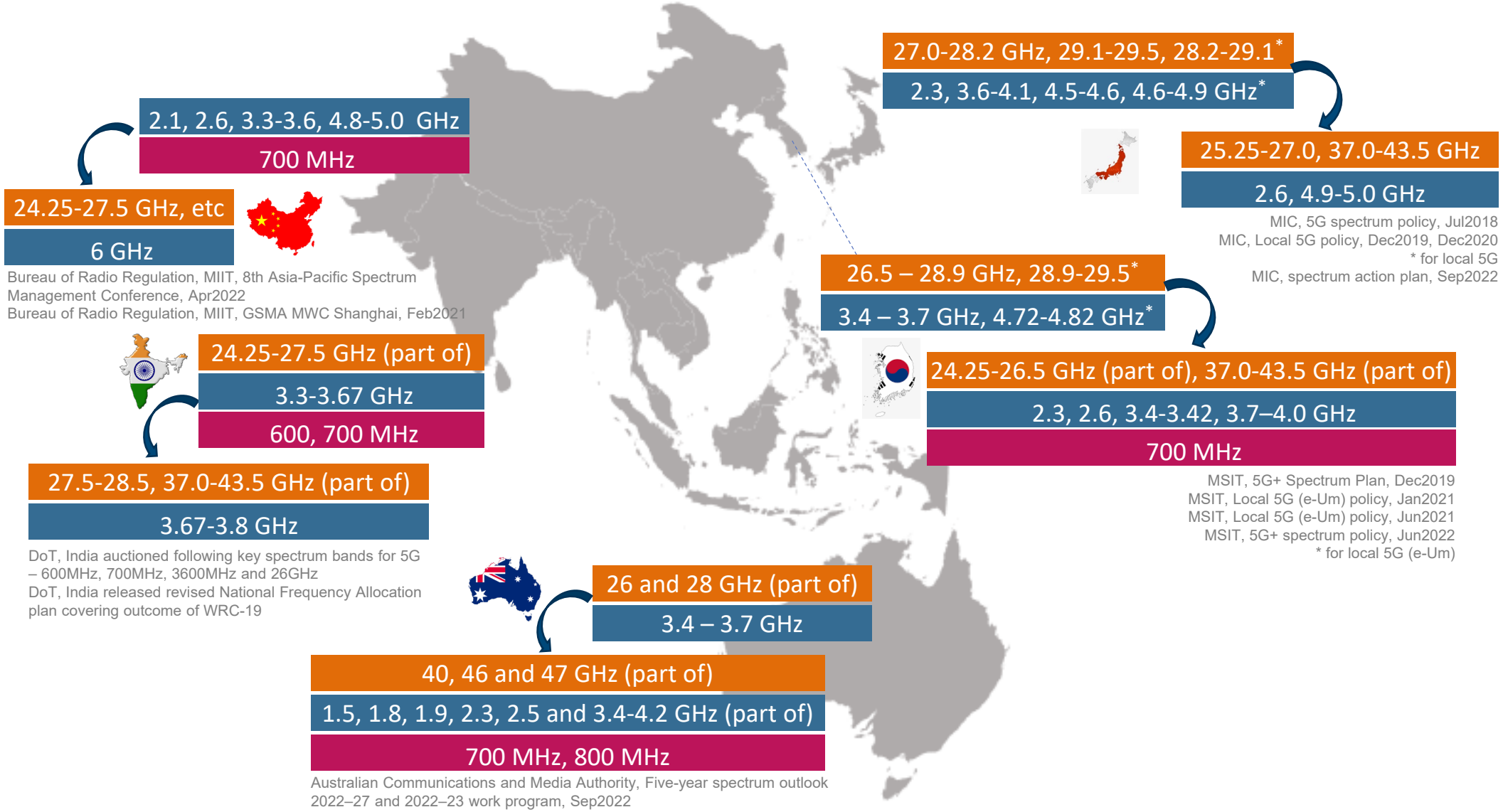
Spectrum for coverage, capacity and ultra experience

24.25 GHz to 29.5 GHz, 37.0 GHz to 43.5 GHz, etc	1.8 GHz, 2.3 GHz, 2.6 GHz, 3.3 GHz to 4.2 GHz, 4.4 GHz to 5 GHz, etc	600 MHz, 700 MHz, 800 MHz, etc
High-bands Ultra experience layer	Mid-bands Capacity-coverage layer	Low-bands Basic coverage layer



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Initial Deployment & Expansion Spectrum
Examples from APT region to illustrate some of the options available



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GSA views on WRC-23

GSA encourages administrations to plan, support harmonization and secure availability for low & mid band expansion

Agenda Item 1.1

GSA would welcome a decision by WRC-23 that globally expands the use of the 4800-4990 MHz band by IMT

- **Preference**: Delete pfd limit from RR No. **5.441B** and rely on RR No. **9.21** (*Methods F, G and H*). Optionally, introduce bi/multilateral agreements.
- **Note:** A significant relaxation* of the pfd limit could allow for largely unconstrained IMT macro cell deployments in coastal cities (*Methods C and D, possibly Alternatives 3-5**).

*GSA is still assessing what relaxation (pfd limit and distance) would enable unconstrained IMT use

Agenda Item 1.2

3.3-3.4 GHz (R1): Amend RR Nos. **5.429A** and **5.429B** to remove stringent conditions and add additional country names

3.3-3.4 GHz (R2): Upgrade MS to primary and amend RR Nos. **5.429C** and **5.429D** to apply in all of Region 2 and remove stringent conditions (*Method 2B*)

3.6-3.8 GHz (R2): Amend RR No. **5.434** to apply to 3.6-3.8 GHz in all of Region 2, and remove the need to seek agreement under RR No. **9.21** (*Method 3B*)

6425-7025 MHz (R1): GSA supports studies towards IMT identification in this region

7025-7125 MHz (all): GSA supports studies towards IMT identification globally

10-10.5 GHz (R2): GSA supports studies towards IMT identification in this region

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GSA Views on WRC 23 - continued

GSA encourages administrations to plan, support harmonization and secure availability for low & mid band expansion

Agenda Item 1.3

GSA would welcome a decision by WRC-23 that expands the benefits from the already large existing ecosystem in this band

- Upgrade MS to primary and identify for IMT to leverage these benefits (*Method D*)
- No technical conditions necessary (*Method D*) but if some conditions would have to be applied, they should not be more restrictive than those for the 3400-3600 MHz band (ref. RR No. **5.430A**)

Agenda Item 1.5

GSA would welcome a decision by WRC-23 that opens possibilities to further harmonize the use of 470-694 MHz with other countries outside of Region 1

- Add primary mobile allocation to 470-694 MHz in Region 1 (*certain Alternatives of Methods B and C*)
- GSA welcomes support for IMT identification from interested administrations for this frequency band (*Alternatives B2, C2, C4 and C8*)

AI 10

GSA supports proposals for a potential WRC-27 agenda item for IMT from within 7-24 GHz

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The Industry Voice of the Global Mobile Ecosystem

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For the benefit of billions

Mobile is used by over 5 billion people worldwide every day. It creates business opportunities, connects us with loved ones, facilitates healthcare and education, and allows us to enjoy the things that make life worth living.