Panel Discussion on future spectrum studies in ITU and APT meetings

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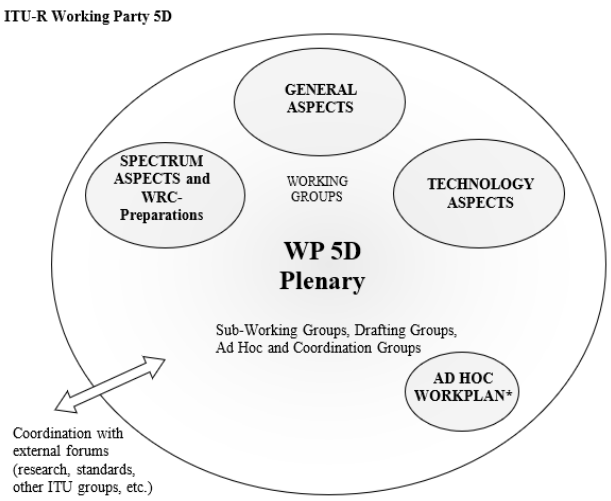
ITU-R WP5D

- Working modalities background
  - WRC-27 preparations are ongoing.
  - Discussions were held on whether “Spectrum aspects” and WRC-27 preparations” will have separate working groups.
  - Decided to have a single working group. “Spectrum Aspects and WRC Preparation (SEPC and WRC PREP)” and that spectrum aspects are not limited to WRC-27.
  - AdHoc workplan will continue to coordinate the work within WP5D.
- Discussions on impact of RLAN on IMT in the 6425-7125MHz (1200 vs 640 vs 500MHz for RLAN): Carried forward to the next meeting.

WG SPECTRUM ASPECTS and WRC Preparations	– To undertake co-existence studies, develop spectrum plans, and channel/frequency arrangements for IMT. This includes spectrum sharing between IMT and other radio services/systems coordinating as appropriate with other Working Parties in ITU-R. – For the study period between WRC-23 and WRC-27, WP 5D has the lead responsibility for the preparatory work on WRC-27 AI 1.7 and WP 5D will collaborate closely with WP 4C on agenda item 1.13 and in particular WP 5D will perform those studies on agenda item 1.13 that were assigned to WP 5D by CPM 27-1.



ITU-R WP5D: Inputs on key work

- SWG Sharing Studies
  - 3400-3600 MHz: Mitigation measures between FSS and IMT
  - HIBS characteristics for sharing and compatibility: Work in progress and retained as working document.
- SWG frequency arrangements
  - Updates to ITU-R M.1036 to incorporate updates based on WRC-23. WIP. (M.1036: Frequency arrangements for implementation of the terrestrial component of International Mobile Telecommunications in the bands identified for IMT in the Radio Regulations): ETD: Nov 2024
- SWG IMT Characteristics
  - SWG prepared a working document on “Characteristics of terrestrial component of IMT for sharing and compatibility studies in preparation for WRC-27” to capture all relevant information as the work progresses.
  - Detailed work plan: to create a separate document on “Elements towards Enhanced Active Antenna Array Radiation Pattern Model for IMT Base Stations and User Equipment”
  - Work to continue on IMT-2020 sharing parameters for 24.25-86GHz WRC19 AI 1.13 and 470MHz to 10.5GHz on WRC-23 AI1.2

Summary of WRC-27 AI in ITU SG5

TABLE A

Summary of WRC-27 agenda items for which the Working Parties of Study Group 5 are a responsible or contributing group

(Reference: Document 5/1)

Legend: R = Responsible group; C = Contributing group; * = see notes below the table.

AI	Topic	Resolution	WP 5A	WP 5B	WP 5C	WP 5D	Other WPs/TG (R)	R
1.1	Aeronautical and maritime ESIM	Res. **176 (Rev.WRC-23)**	C	C	C	C	3M, 4A, 4C, 7B, 7C, 7D	4A
1.2	FSS with small antenna sizes in the frequency band 13.75-14 GHz	Res. **129 (WRC-23)**	C	C	C	-	3M, 4A, 7A, 7B, 7C	4A
1.3	Non-GSO in the FSS in the frequency band 13.75-14 GHz	Res. **130 (WRC 23)**	C	-	C	-	3M, 4A, 7C, 7D	4A
1.4	New allocation for FSS in 17.3-17.7 GHz and BSS in 17.3-17.8 GHz	Res. **726 (WRC 23)**	C	C	C	-	3M, 4A, 4B, 6B, 7C	4A
1.5	Unauthorized operations of non-GSO FSS and MSS earth stations	Res. **14 (WRC 23);**	-	-	-	-	1B, 3M, 4A, 4B, 4C, 6A, 7B, 7C, 7D	4A
1.6	FSS in the bands 37.5-42.5 GHz, 42.5-43.5 GHz, 47.2-50.2 GHz and 50.4-51.4 GHz	Res. **131 (WRC 23)**	C	C	C	C	1B, 3M, 4A, 4B, 4C, 6A, 7B, 7C, 7D	4A
1.7	IMT in the bands 4400-4800 MHz, 7125-8400 MHz (or parts thereof) and 14.8-15.35 GHz	Res. **256 (WRC-23)**	C	C	C	**R**	1B, 3K, 3M, W4A, 4C, 7B, 7C, 7D	5D
1.8	Radiolocation service in the bands 231.5-275 GHz and the frequency range 275-700 GHz	Res. **663 (Rev.WRC-23)**	C	**R**	C	-	3J, 3K, 3M, 4A, 4C, 7C, 7D	5B
1.9	Update RR, Appendix 26 in support of aeronautical mobile (OR) high frequency modernization	Res. **411 (WRC 23)**	-	**R**	C	-	3L, 6A, 7A	5B
1.10	Protection of FS and MS by FSS, MSS and BSS in the bands 71-76 GHz and 81-86 GHz	Res. **775 (Rev.WRC-23)**	C	C	**R**	-	1A, 3J, 3M, 4A, 4C, 6A, 7C	5C
1.11	Space-to-space transmission between NGSO and GSO in the bands 1.6 GHz and 2.5 GHz	Res. **249 (Rev.WRC-23)**	C	C	C	C	3L, 3M, 4A, 4B, 4C, 6A, 7B, 7C, 7D	4C
1.12	MSS (low-data NGSO) in the bands 1427-1432 MHz, 1645.5-1646.5 MHz, 1880-1920 MHz and 2010-2025 MHz	Res. **252 (WRC 23)**	C	C	C	C	3L, 3M, 4B, 4C, 7B, 7C, 7D	4C
1.13	MSS (direct to device) in IMT-bands between 694/698 MHz to 2.7 GHz	Res. **253 (WRC-23)**	C	C	C	C	3L, 3M, 4A, 4B, 4C, 6A, 7B, 7C, 7D	4C*
1.14	MSS in the 2 GHz	Res. **254 (WRC 23)**	C	-	C	C	3L, 4B, 4C, 7B, 7C	4C
1.15	Space research service allocations, for communications on the lunar surface and lunar orbit	Res. **680 (WRC 23)**	C	C	C	C	1B, 3J, 4A, 4C, 7A, 7B, 7C, 7D	7B
1.16	Protection of RAS in radio quite zones	Res. **681 (WRC 23)**	C	C	-	C	1B, 3J, 3M, 4A, 4C, 7D	7D
1.17	Space weather sensors (several bands in the 30 MHz, 70 MHz, 600 MHz range)	Res. **682 (WRC 23)**	C	C	C	C	3L, 3M, 4A, 4C, 6A, 7B, 7C, 7D	7C
1.18	Protection of EESS & RAS from unwanted emissions of active sensors above 76 GHz	Res. **712 (WRC-23)**	C	C	C	-	3J, 3M, 4A, 4C, 7C, 7D	7C/7D
1.19	EESS globally in 4.3 and 8.5 GHz	Res. **674 (WRC-23)**	C	C	C	C	4A, 7B, 7C	7C

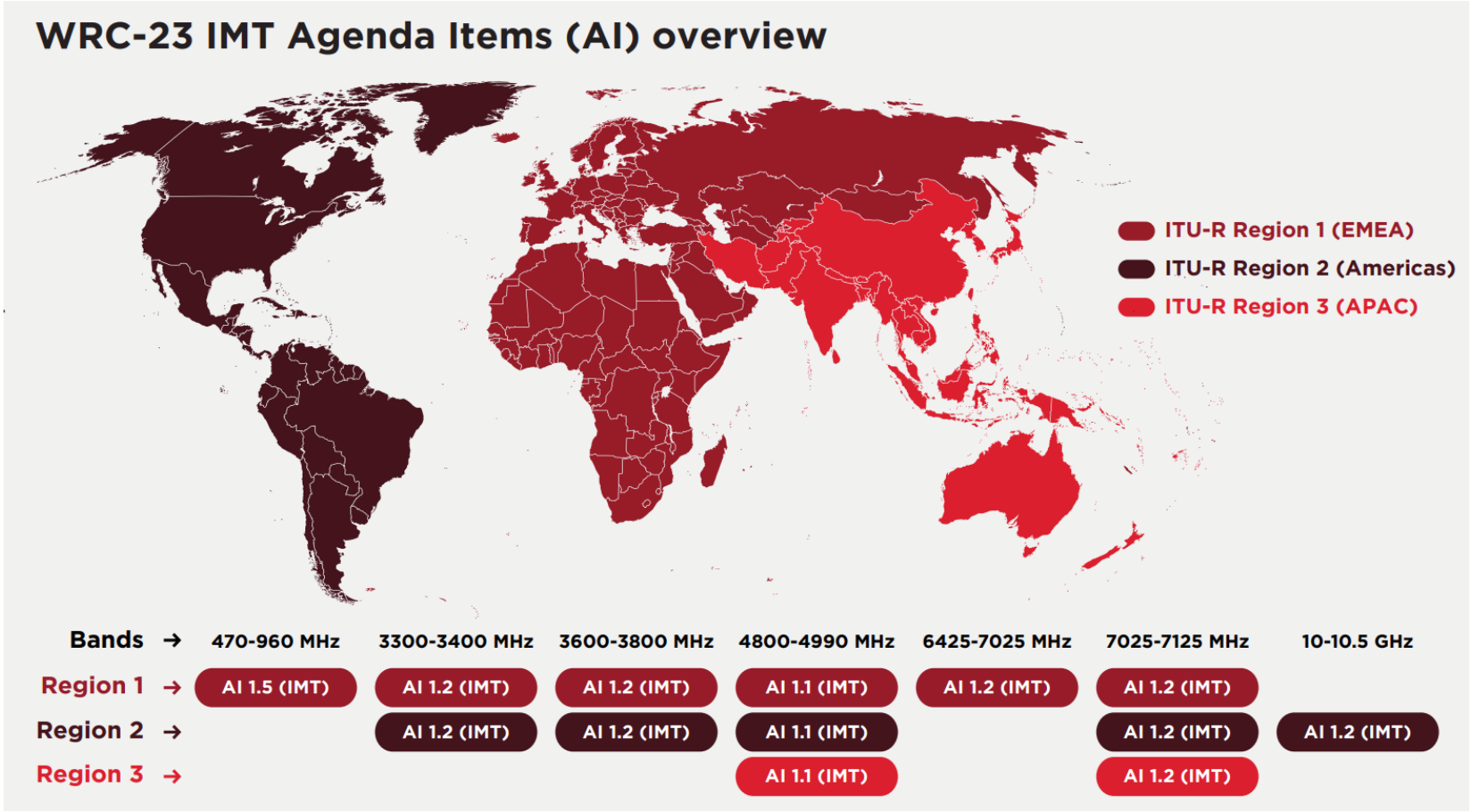
*For WRC-27 agenda item 1.13, CPM27-1 has clarified which parts of the work will be conducted in WP4C and which parts will be conducted in WP5D and how the two group should cooperate, see details below.

ITU-R WP5D work as requested by WRC-23

WP 5D work as requested by WRC-23

WRC Res/Rec	Title
Resolution 212 (Rev.WRC-23)	Implementation of International Mobile Telecommunications in the bands 1 885-2 025 MHz and 2 110-2 200 MHz
Resolution 223 (Rev.WRC-23)	Additional frequency bands identified for International Mobile Telecommunications
Resolution 224 (Rev.WRC-23)	Frequency bands for the terrestrial component of International Mobile Telecommunications below 1 GHz
Resolution 225 (Rev.WRC-23)	Use of additional frequency bands for the satellite component of IMT
Resolution 646 (Rev.WRC-19)	Public protection and disaster relief
Resolution 703 (WRC-07)	Calculation methods and interference criteria recommended by ITU R for sharing frequency bands between space radiocommunication and terrestrial radiocommunication services or between space radiocommunication services
Resolution 749 (Rev.WRC-23)	Use of the frequency band 790-862 MHz in countries of Region 1 and the Islamic Republic of Iran by mobile applications and by other services
Resolution 760 (Rev.WRC-23)	Provisions relating to the use of the frequency band 694-790 MHz in Region 1 by the mobile, except aeronautical mobile, service and by other services
Resolution 213 (WRC-23)	Use of high-altitude platform stations as International Mobile Telecommunications base stations in the frequency band 694-960 MHz, or portions thereof
Resolution 218 (WRC-23)	Use of high-altitude platform stations as International Mobile Telecommunications base stations in the frequency band 2 500-2 690 MHz, or portions thereof
Resolution 219 (WRC-23)	Terrestrial component of International Mobile Telecommunications in the frequency band 10-10.5 GHz in Region 2
Resolution 220 (WRC-23)	Terrestrial component of International Mobile Telecommunications (IMT) within the frequency band 6 425-7 125 MHz
Recommendation 16 (Rev.WRC-19)	Interference management for stations that may operate under more than one terrestrial radiocommunication service
Recommendation 34 (WRC-23)	Principles for the allocation of frequency bands
Recommendation 76 (WRC-12)	Deployment and use of cognitive radio systems
Recommendation 206 (Rev.WRC-23)	Studies on the possible use of integrated mobile-satellite service and ground component systems in the bands 1 525-1 544 MHz, 1 545-1 559 MHz, 1 626.5-1 645.5 MHz and 1 646.5-1 660.5 MHz
Recommendation 207 (Rev.WRC-19)	Future IMT systems

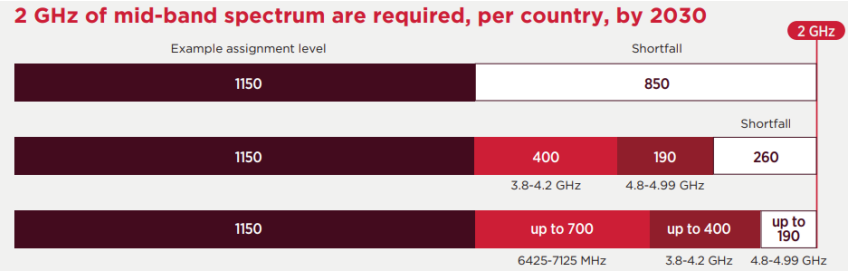
Critical bands of concern

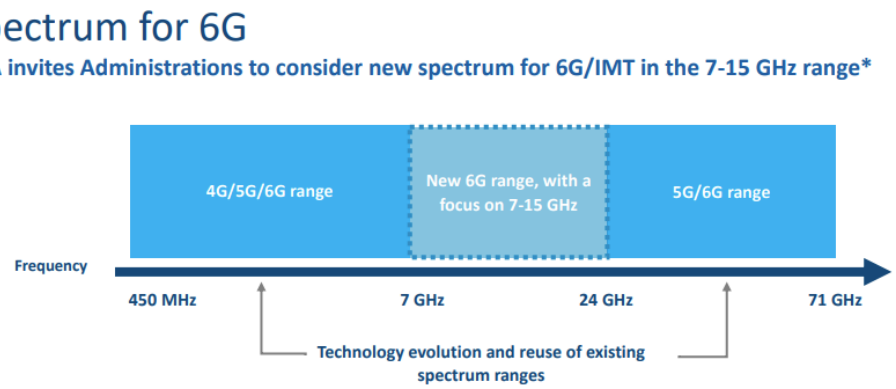


- Source: GSMA

Discussion points:

- IMT expects 2GHz requirement by 2030 (GSMA). Target bands:
  - 3.8-4.2GHz (400MHz), 4.8-4.99 GHz (190MHz), 6425-7125MHz (700MHz)
  - Current allocation in India per TSP for IMT: 35-70MHz and 100/70MHz in 3.5GHz.
- WiFi: 94 + 160MHz in the 2.3 and 5GHz bands.
- Outdoor coverage: Lower frequences are more suitable for high-power/high-tower sort of situations.
- 7-25GHz is range of interest from GSMA/GSA 6G (WRC-27 & IMT/6G)
  - 7.125-8.5, 10.7-11.7, 11.7-12.75, 12.75-13.25, 14.0-14.8, 14.8-15.35 GHz

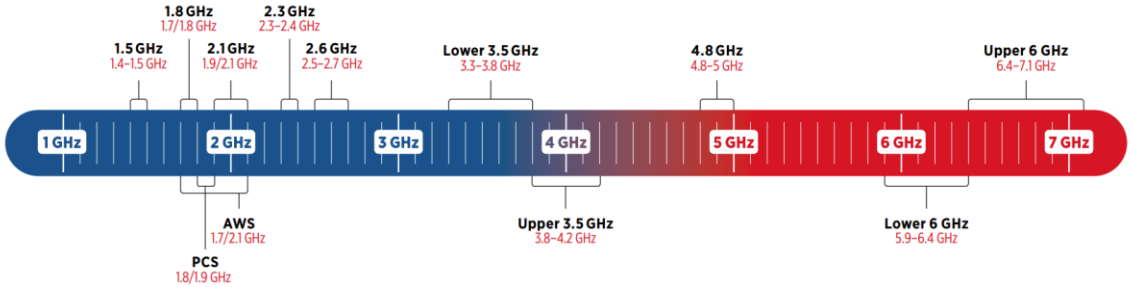


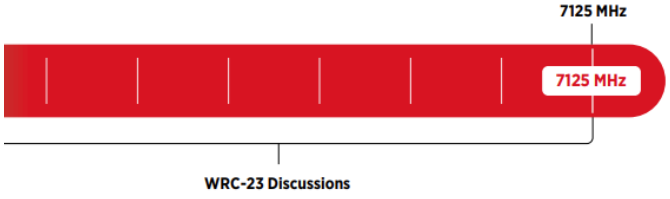


Source: GSMA/GSA

Possible bands for study

Global mid-band options





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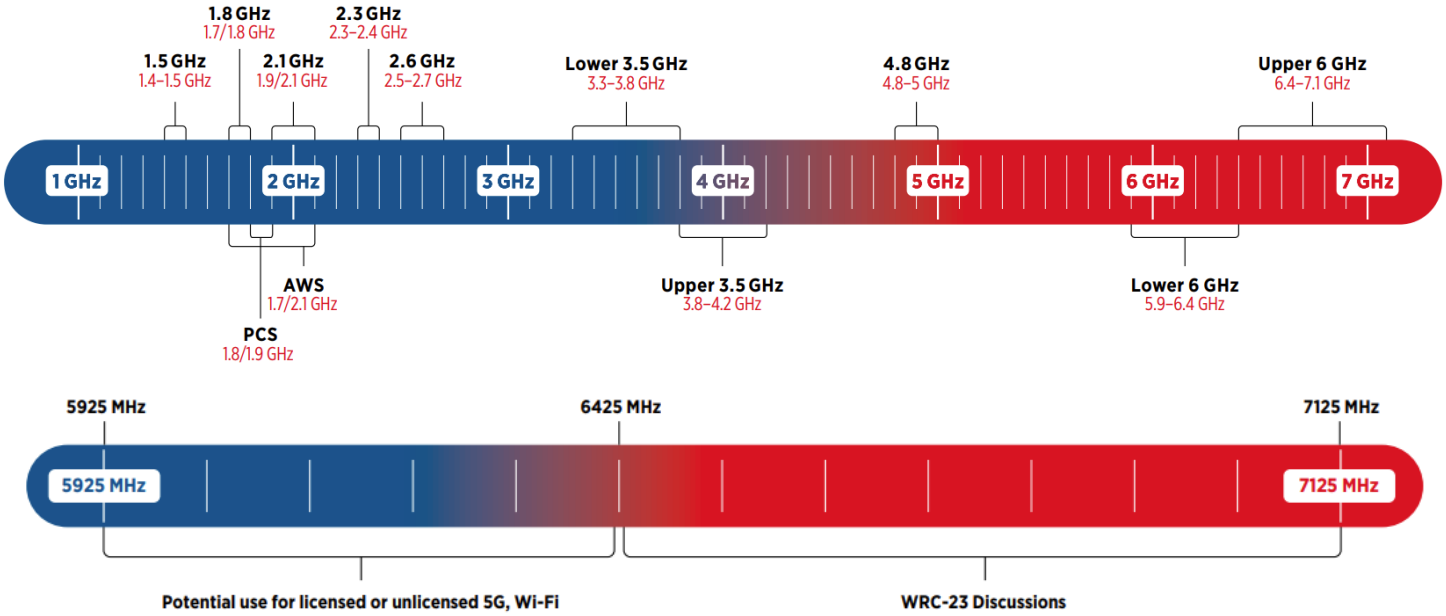

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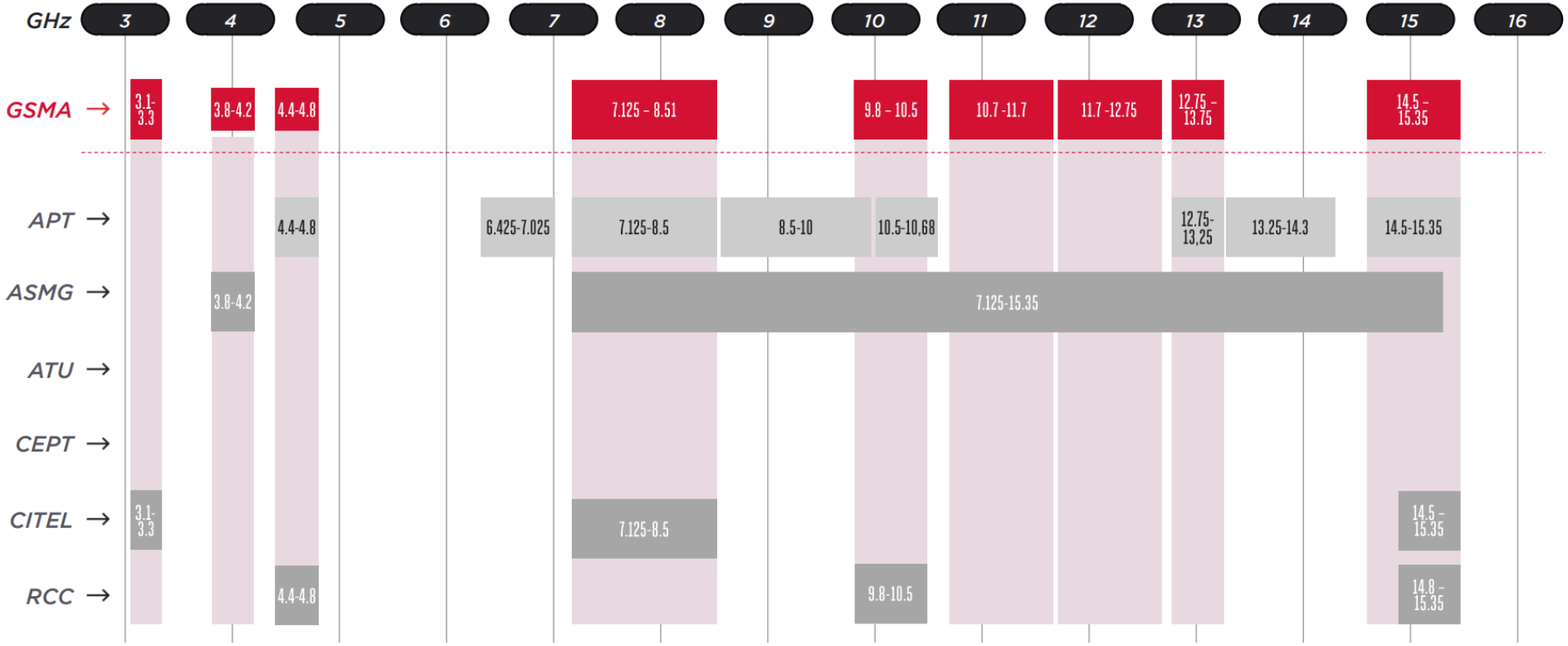

WRC-23 Highlights

- 3.5GHz (3.3 – 3.8GHz) as harmonized band for Europe, Middle East and Africa along with Americas.
- 6GHz band (6.425 – 7.125GHz) identified as IMT band for all regions. (5G Advanced and beyond)
- Low band (470-694MHz): More spectrum in this band for mobile use in the EMEA region.
- Estimate of 2GHz spectrum requirement in the mid-spectrum by 2030.

Discussion/Questions

Thank you

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