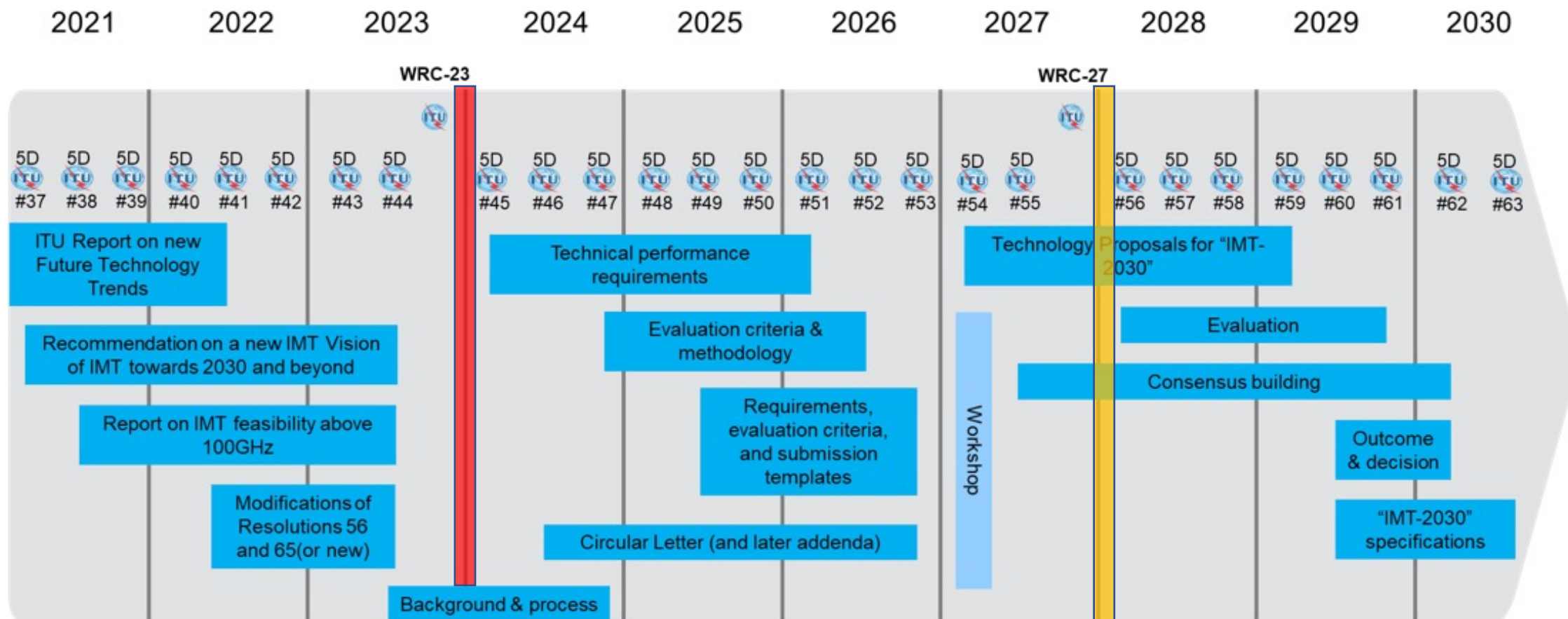


AI 10 – IMT Identification

Preparation towards IMT-2030

14th Feb 2023
IAFI – Workshop

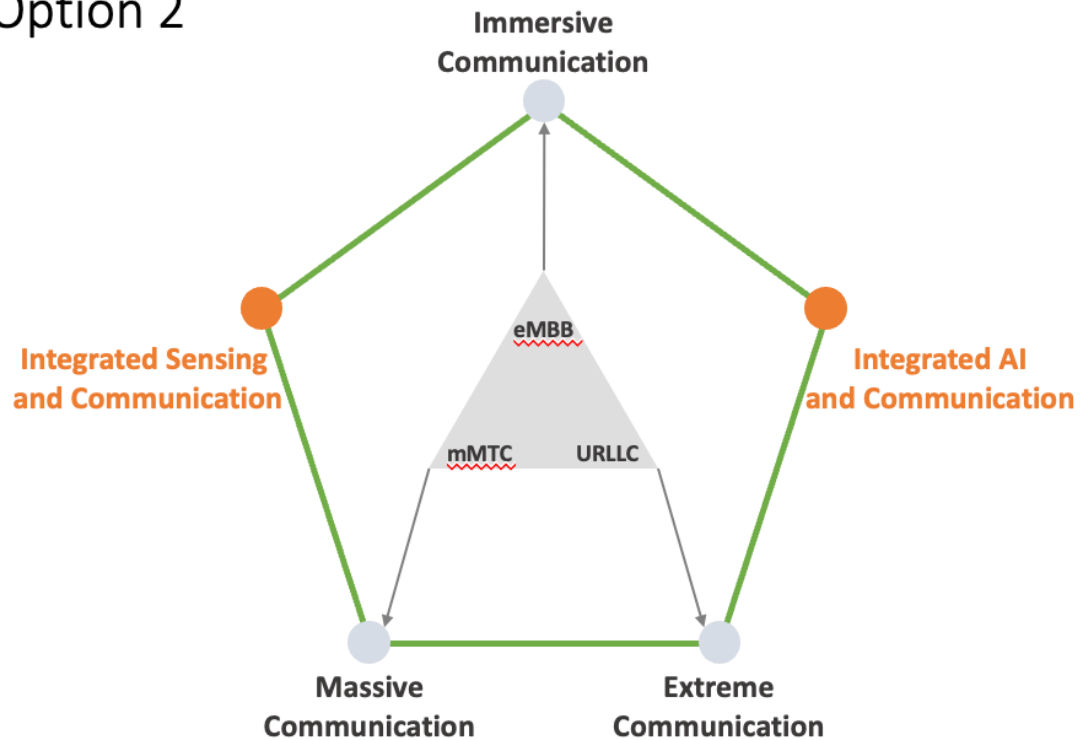
WP 5D timeline for IMT towards 2030 and beyond



Note 1: Meeting 5D#59 will additionally organize a workshop involving the Proponents and registered IEGs to support the evaluation process
 Note 2: While not expected to change, details may be adjusted if warranted. Content of deliverables to be defined by responsible WP 5D groups

WP5D#43 - Interim representation

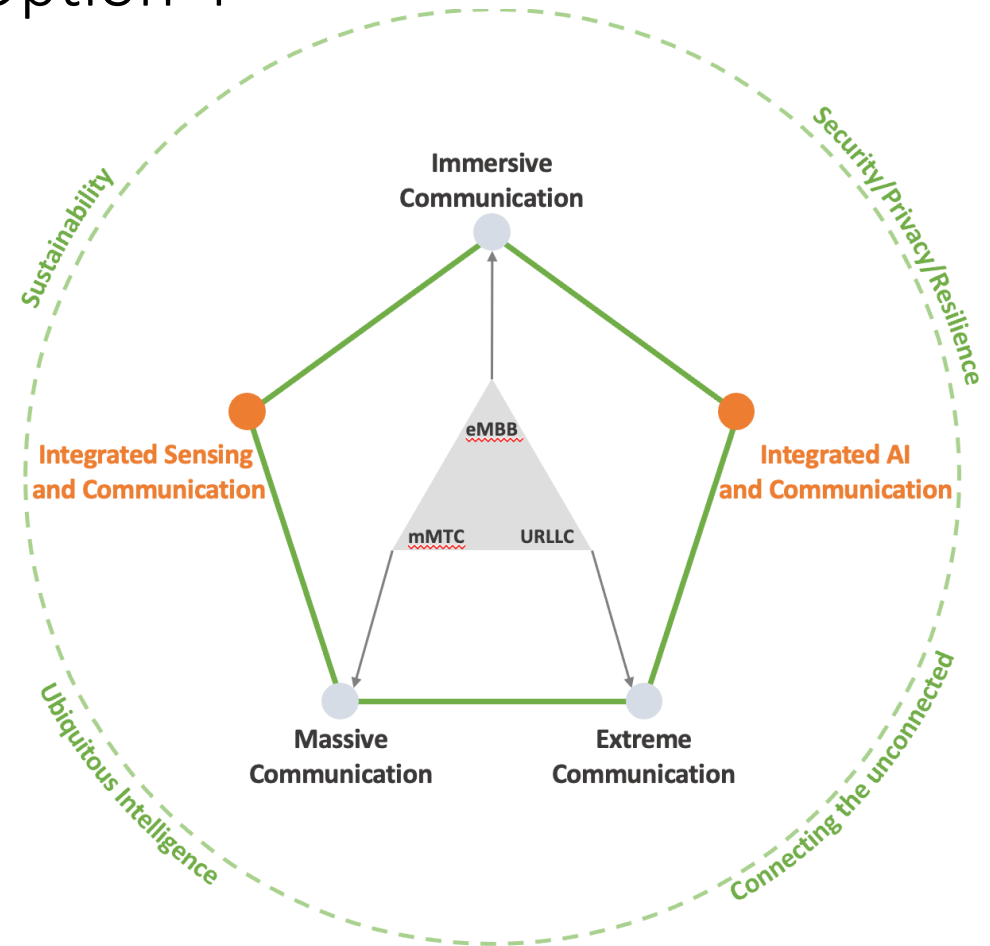
Option 2



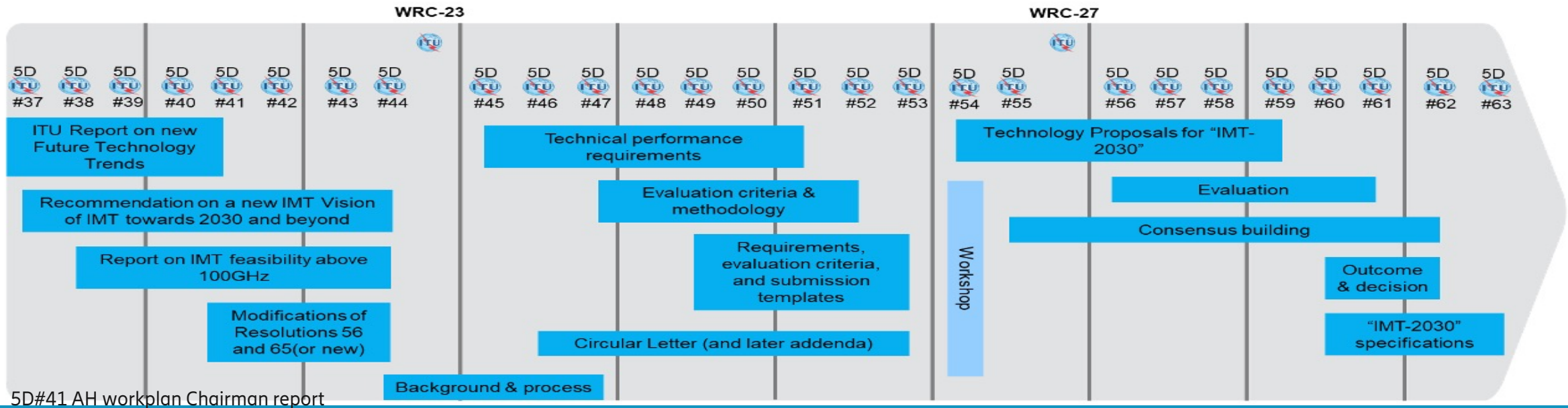
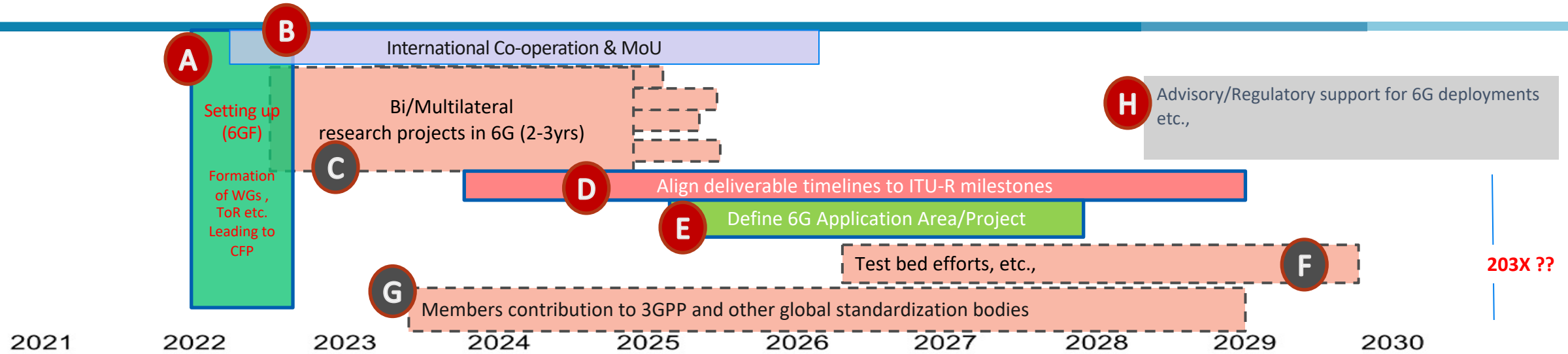
Overarching aspects:

- Sustainability
- Ubiquitous Intelligence
- Security/Privacy/Resilience
- Connecting the unconnected

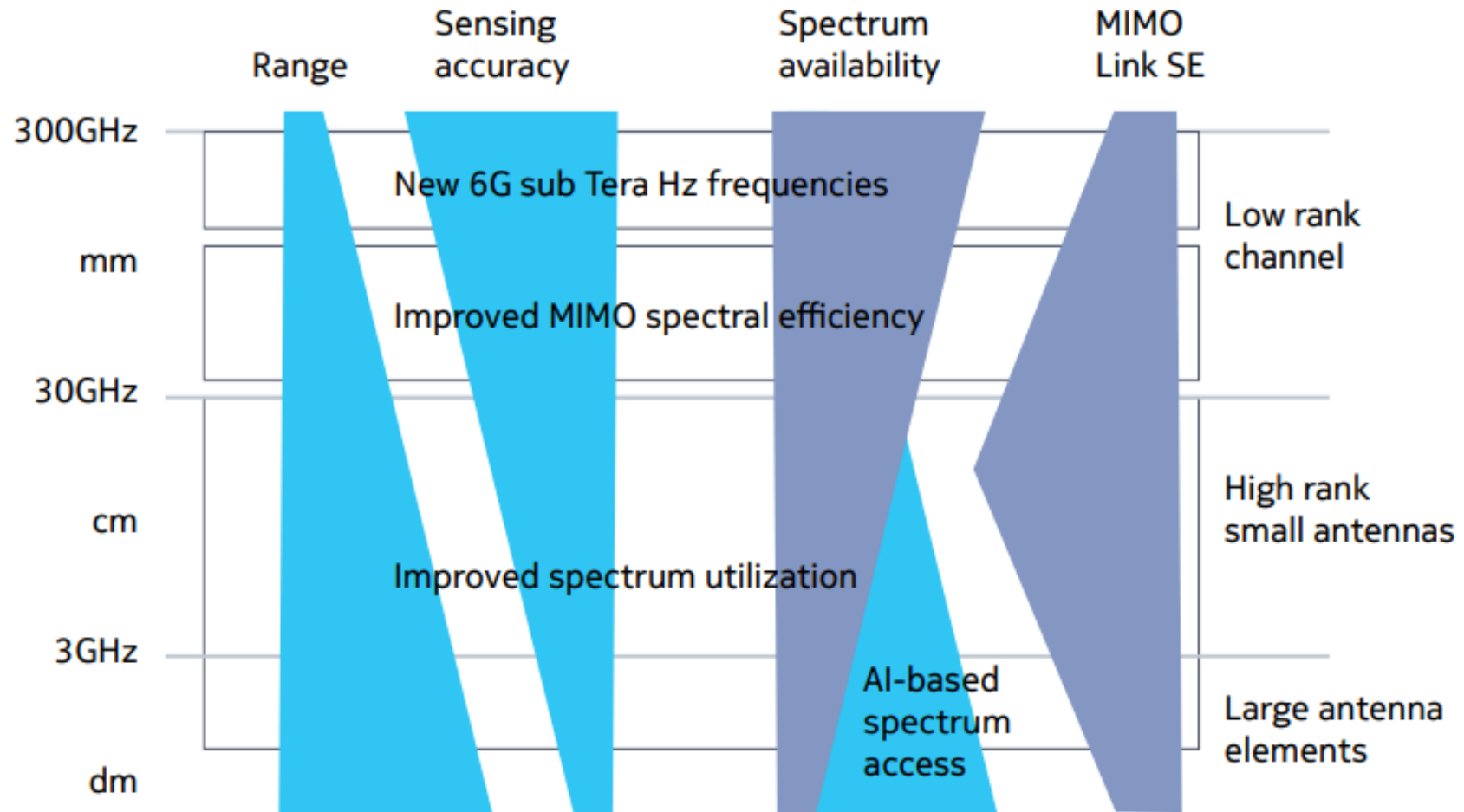
Option 4



Timeline : Relevant 6G activities



Spectrum Options for 6G



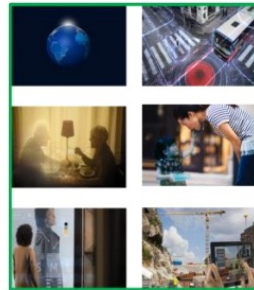
Enabling the IMT-2030/6G Vision

Maintain and improve the **5G capabilities**



Existing spectrum is crucial, gradual move to 6G

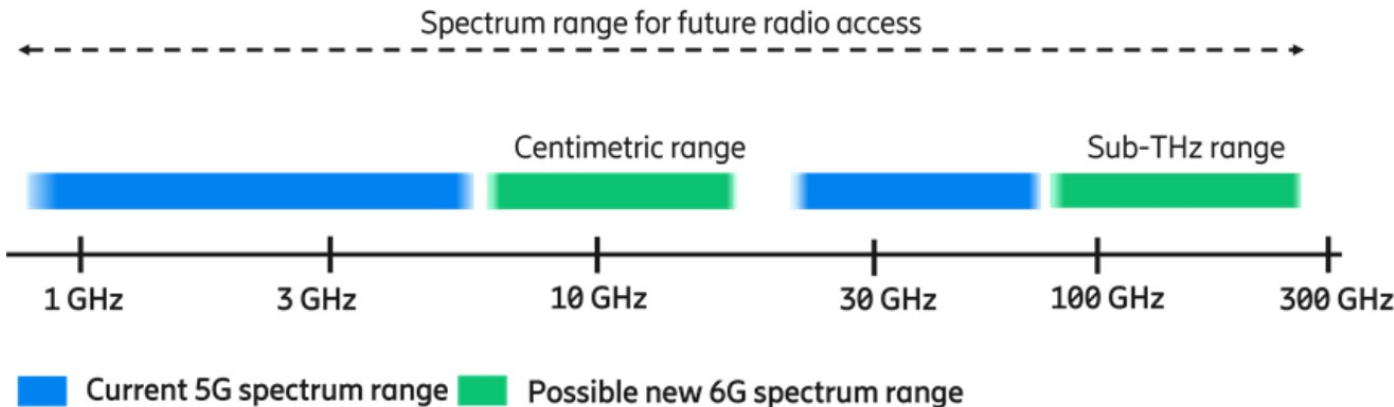
Enable the **new 6G use cases** and enhance **5G/5G-Advanced services**



Spectrum from within the **centimetric range 7-24 GHz** is **essential for 6G/IMT-2030**, with a focus on the lower parts of this range. Support on IMT for AI10 needed from the regional organizations (APT, ATU, ASMG, CEPT, CITELE, RCC)



Sub-THz frequencies offer the Tbps possibility **for niche scenarios**, thus should only be seen as **complementary**



An Agenda Item on IMT that is established in WRC-23 towards WRC-27 is a first step towards creating a global ecosystem for 6G/IMT-2030

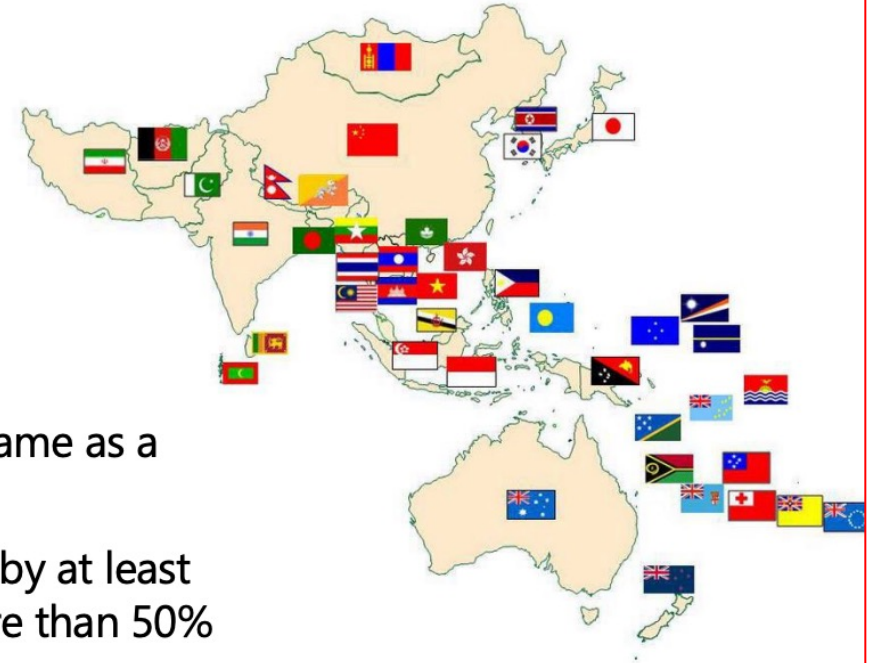
APT for IMT Agenda Item at WRC-27

APT is one of the Regional Telecommunication Organizations, as defined in the ITU Convention No. 269B

APT has been the focal and only organization for APT Members for the preparation of major ITU conferences such as the World Radiocommunication Conferences (WRC) and the Radiocommunication Assembly (RA)

All APT Members will be asked to consider inclusion of their country name as a signatory to each "Preliminary APT Common Proposal (**PACP**)"

A **PACP** becomes an "APT Common Proposal" (**ACP**) if it is Supported by at least 25% of the APT Members (Administrations), AND not opposed by more than 50% of the number of Members who support it



APT have 38 Member countries =>

- **To have an ACP on IMT for WRC-27 there is a need for minimum of 10 countries support!**
- **AND not opposed by more than 5 countries!**

IMT AI10 - Inputs APG23-5

- **India** : 7-24GHZ, 92-275 GHz
- **Korea, Japan, Vietnam**
 - The specific frequency bands to be included in this new agenda item should be discussed further. In this regard, the co-signed APT Members will continue discussion with an aim to provide the specific frequency bands for the discussion of APG23-6
- **IRN** Frequency bands/ranges need to be clarified and specified
- **Australia** : needs to be focused on frequency ranges that have been assessed as being feasible for study, taking into account the potential for coexistence with incumbent services
- **GSMA** - possible spectrum identification for IMT is to consider bands in the 7-24 GHz frequency range, with a special focus on bands in the 7-15 GHz range
- **GSA** - The estimated additional spectrum need per network is ~500 to ~750 MHz depending on the existing mid bands spectrum available for IMT and on the number of networks in a specific country.

Spectrum Needs

Relevant Aspects

- traffic forecast-based approach,
- application-based approach and technical performance-based approach
- More accurate spectrum needs calculations would require many assumptions including country/deployment dependent (density of population, IMT-2030/6G penetration, etc.) data.

Leverage Technology Advancement

- IMT-2030/6G will have advanced development of its air-interface technology compared to IMT-2020/5G, Codecs etc.,
- For several use-cases such as immersive XR, advanced video codec, VVC (Versatile Video Coding), optimistic assumption on compression (e.g., 800:1)
 - a) spectrum Efficiency
 - b) Sensing/Positioning Applications (wider bandwidth),
 - c) 6G specific use cases –
 - Immersive communication (cloud XR), fully immersive (16K x 16K) - be 0.45 Gbit/s (20ms to 10ms)
 - Holographic - (830MHz ~ 1.1GHz) , 3D voxels - volumetric media –~1Tbps (indoor)
 - Joint Sensing - 50cm ~300MHz, 20cm- 750MHz, Industrial Indoor (~1cm – ~15GHz)

Multiple Network , existing eMBB usage

How to prepare ?

7.125 – 24 GHz Frequency Bands

Frequency Portion (MHz)	Applications (Services)	Number of systems/licenses	Type of use
7075 – 7250 MHz	Fixed	6440 – 7100 MHz Fixed “7 GHz (Lower)” band	Commercial, private
		7100 – 7425 MHz Fixed “7 GHz (Middle)” band	
7250 – 7750 MHz	Fixed and Fixed – Satellite (Space-to-Earth)	7250 – 7750 MHz Fixed satellite “X” band – downlink	Commercial, private
		7425 – 7725 MHz Fixed “7 GHz (Upper)” band	
		7725 – 8275 MHz Fixed “8 GHz (Lower)” band	
7750 – 7900 MHz	Fixed	7725 – 8275 MHz Fixed “8 GHz (Lower)” band	Commercial, private
7900 – 8400 MHz	Fixed and Fixed – Satellite (Earth-to-Space)	7725 – 8275 MHz Fixed “8 GHz (Lower)” band	Commercial, private
		7900 – 8400 MHz Fixed satellite “X” band – uplink	
		8275 – 8500 MHz Fixed “8 GHz (Upper)” band	
8400 – 8500 MHz	Fixed	8275 – 8500 MHz Fixed “8 GHz (Upper)” band	Commercial, private
8500 – 8750 MHz	Radiolocation	Short Range Devices – Limited to radiolocation use	Commercial, Private

8750 – 8850 MHz	Radiolocation and Aeronautical Radionavigation	8750 – 8850 MHz Airborne Doppler radar	Commercial, private
		8500 – 10000 MHz Short Range Devices – Limited to radiolocation usage	
8850 – 9000 MHz	Radiolocation Maritime Radionavigation	8500 – 10000 MHz Short Range Devices – Limited to radiolocation usage	Commercial, private
9000 – 9200 MHz	Aeronautical Radionavigation	8500 – 10000 MHz Short Range Devices – Limited to radiolocation usage	Commercial, private
9200 – 9300 MHz	Radiolocation and Maritime Radionavigation	8500 – 10000 MHz Short Range Devices – Limited to radiolocation usage	Commercial, private, and emergency
		9200 – 9500 MHz Maritime radar	
		9200 – 9500 MHz Search and rescue transponders	
9300 – 9500 MHz	Radiolocation and Maritime Radionavigation	8500 – 10000 MHz Short Range Devices – Limited to radiolocation usage	Commercial, private, and emergency
		9200 – 9500 MHz Maritime radar	
9500 – 10000 MHz	Radiolocation	9200 – 9500 MHz Search and rescue transponders	Commercial, private
		8500 – 10000 MHz Short Range Devices – Limited to radiolocation usage	

How to prepare ?

Frequency Portion (GHz)	Applications (Services)	Number of systems/licences	Type of use
7,125-7,145	Point-to-point link (Fixed) (Mobile)	1500 Licenses Point-to-point link (Fixed)	Commercial
7,145-7,190	Point-to-point link (Fixed) (Mobile) (Space Research)		
7,190-7,235	(Earth Exploration - Satellite) Point-to-point link (Fixed) (Mobile) (Space Research)		
7,235-7,250	(Earth Exploration - Satellite) Point-to-point link (Fixed) (Mobile)		
7,250-7,300	Point-to-point link (Fixed) (Fixed - Satellite) (Mobile)		
7,300-7,375	Point-to-point link (Fixed)		

8,025-8,175	Point-to-point link (Fixed) (Fixed - Satellite) (Mobile) (Earth Exploration - Satellite)	Several Licenses Point-to-point link (Fixed)	
8,175-8,215	Point-to-point link (Fixed) (Fixed - Satellite) (Meteorological - Satellite) (Mobile) (Earth Exploration - Satellite)		
8,215-8,400	Point-to-point link (Fixed) (Fixed - Satellite) (Mobile) (Earth Exploration - Satellite)		
8,400-8,500	Point-to-point link (Fixed) (Mobile except Aeronautical Mobile) (Space Research)		
8,500-8,550	(Radiolocation)		
8,550-8,650	(Earth Exploration - Satellite) (Radiolocation) (Space Research)		
8,650-8,750	(Radiolocation)		
8,750-8,850	(Radiolocation) (Aeronautical Radionavigation)	/	/
8,850-9,000	(Radiolocation) (Maritime Radionavigation)	2000 Licenses Radar (Maritime Radionavigation) Several Licenses Radar (Radiolocation)	Government Private Commercial
9,000-9,200	(Aeronautical Radionavigation) Radar (Radiolocation)		
9,200-9,300	(Earth Exploration - Satellite) Radar (Radiolocation) Radar (Maritime Radionavigation)		
9,300-9,500	Radar (Radiolocation) (Earth Exploration - Satellite) (Space Research Radiolocation)		

AWG-30/INP-70, Vietnam ((Other inputs - Japan, Korea.. etc)

Thanks