

IMT-2030 - Standards and Roadmap

Update on ITU-activities

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16 September 2026

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-
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ITU is global

The [International Telecommunication Union \(ITU\)](#) is the United Nations specialized agency for information and communication technologies (ICTs)



194 Member states

+1000 Companies/organizations

+170 Academia members

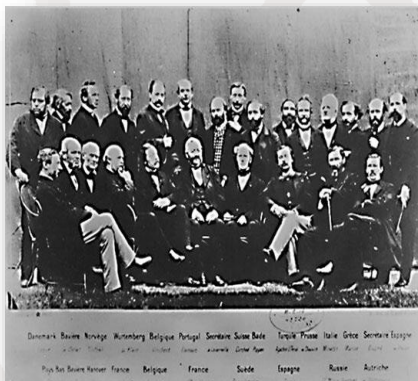
Brief History of ITU

Committed to Connecting the World



1865
(Paris)

The International Telegraph Union:
Founded on 17 May 1865 by 20 nations



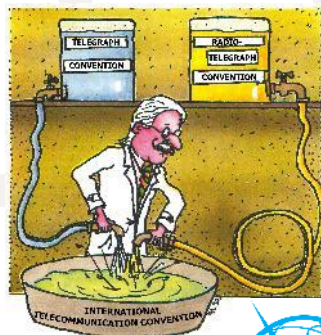
1906
(Berlin)

International Radiotelegraph Convention
(1st Radio Regulations - binding rules)



1932
(Madrid)

Telegraph & Radiotelegraph Conventions merged:
the International Telegraph Union became the **International Telecommunication Union**



1947
(Atlantic City)

- Created the IFRB (International Frequency Registration Board)
- ITU becomes a UN Specialized Agency**



1992
(Geneva)

Radiocommunication Sector (ITU-R):

- ITU-R Study Groups (formerly CCIR)
- RRB (Radio Regulations Board) (formerly IFRB)
- BR (Radiocommunication Bureau)



2025

2026: **120 years of Radio Regulations**



World Radiocommunication Conference (WRC)



163

Member States
represented

3985

Delegates

22%

Women

56

Revised
resolutions

Signed by

151

Member States

43

New
resolutions

ITUWRC

DUBAI2023

20.11.-15.12.23



18.10.-12.11.2027

Shanghai, China

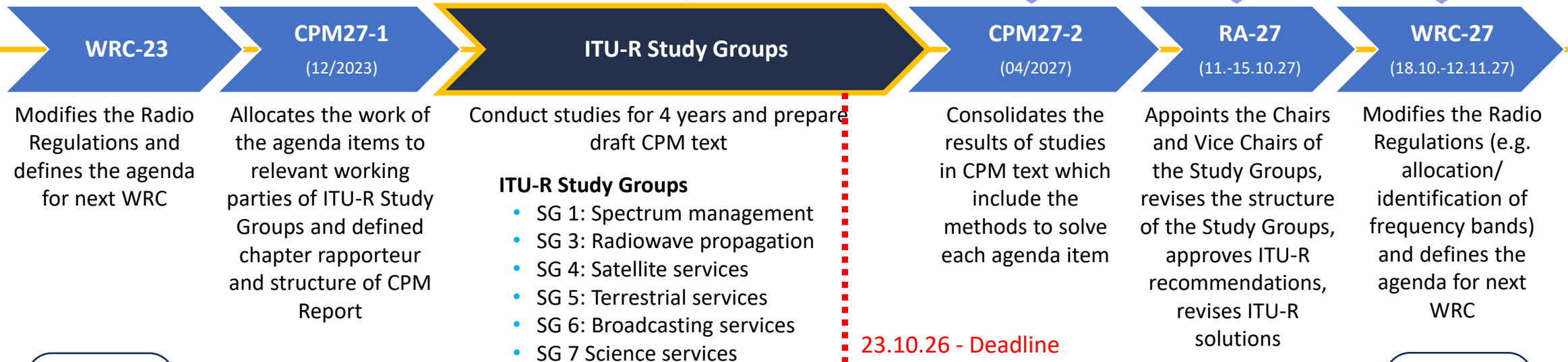
Radio Regulations and WRC-Process



- Intergovernmental treaty governing the use of spectrum / orbit resources by Member States
- Define the rights and obligations of Member States in respect of the use of the limited resources
- Revised and adopted every 4 years by the World Radiocommunication Conference (WRC)

2024-2027: 2026 = YEAR 3 OF THE CYCLE

ITU Member States and ITU-R Members (public & private sectors)



23.10.26 - Deadline draft CPM-text



Regional Groups (& Multi-countries)
Develop and consolidate common proposals to WRC





WRC-27 – Agenda Items (19 +1)

FIXED-SATELLITE AND BROADCASTING-SATELLITE

MOBILE-SATELLITE

- 1.1 Aeronautical/maritime earth stations in motion
47.2-50.2 GHz / 50.4-51.4 GHz
- 1.2 13.75-14 GHz – Uplink earth stations
- 1.3 51.4-52.4 GHz – Gateway earth stations
- 1.4 17.3-17.7/8 GHz – Fixed/broadcasting allocation in Region 3
- 1.5 Unauthorized operations of non-geostationary-satellite orbit earth stations
- 1.6 Equitable access for fixed-satellite service satellite networks/systems
37.5-42.5 GHz / 42.5-43.5 GHz / 47.2-50.2 GHz / 50.4-51.4 GHz
- 7 Satellite regulatory issues

**80% (!) satellite
related agenda items**

Space-to-space links
1 518-1 544 MHz / 1 545-1 559 MHz
1 610-1 645.5 MHz / 1 646.5-1 660 MHz
1 670-1 675 MHz / 2 483.5-2 500 MHz

MSS - Allocations for IoT development
1427-1432 MHz / 1645.5-1646.5 MHz 1880-
1920 MHz / 2010-2025 MHz

MSS - IMT-space stations connectivity

MSS - Additional allocations

- 1.7 4400-4800 MHz / 7125-8400 MHz / 14.8-15.35 – IMT
- 1.8 231.5-275 GHz / 275-700 GHz – Radiolocation
- 1.9 Aeronautical mobile (OR) high frequency modernization
- 1.10 71-76 GHz / 81-86 GHz – Power flux-density / power limits

FIXED, MOBILE AND RADIOLOCATION

SCIENCE

Res. 813 (WRC-23)

- Lunar communications**
- Radio Quiet Zones**
- Space weather sensors protection**
- ≥ 76 GHz – Earth exploration service protection**
- Earth exploration-satellite service allocation**
4200 – 4400 MHz / 8400-8500 MHz

<https://www.itu.int/en/ITU-R/study-groups/rcpm/Pages/wrc-27-studies.aspx>

Work towards WRC-27 in ITU-R

The Conference Preparatory Meeting (CPM) allocates WRC agenda items to the relevant ITU-R Study Group

SG 4 (Satellite Services)

WP 4A

1.1 1.3 1.5
1.2 1.4 1.6

WP 4C

1.11 1.13
1.12 1.14

SG 5 (Terrestrial Services)

WP 5B

1.8
1.9

WP 5C

1.10

WP 5D

1.7

SG 7 (Science Services)

WP 7B

1.15

WP 7C

1.17
1.19

WP 7D

1.18 1.16

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. 685 (WRC-23)	C	C	C	C	1B, 3J, 3M, 4A, 4C, 7B, 7C, 7D	7D
1.16	Protection of RAS in radio quiet 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

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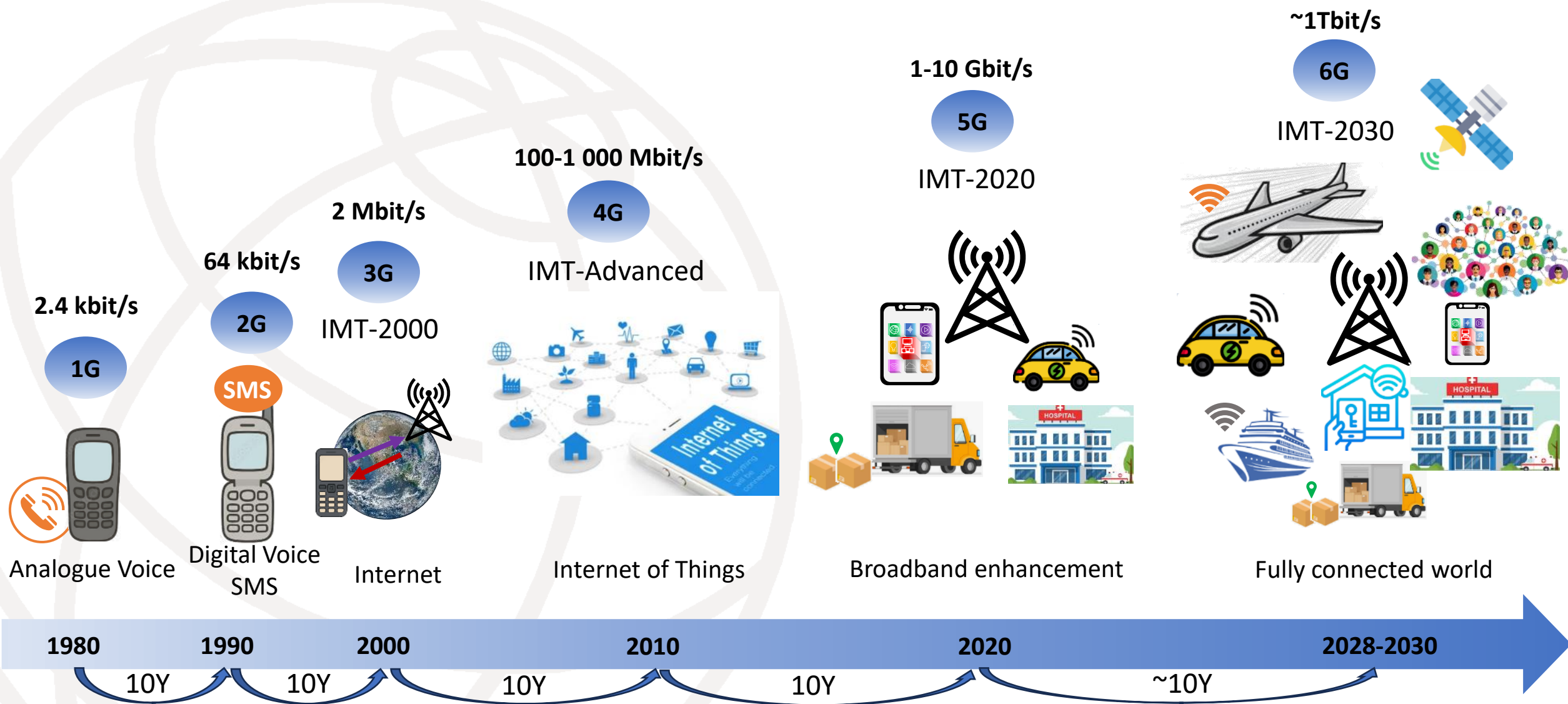
IMT

I nternational

M obile

T elecommunications

Broadband evolution facilitated by ITU



IMT-Family and naming conventions

Resolution ITU-R. 56 “Naming for IMT”

International Mobile Telecommunication (IMT)

Name

Rec.

RIT

(Radio Interface Technology)

IMT-2000

ITU-R M.1457-15

- CDMA-DS (*UMTS*) ⁶
- CDMA-SC / -MC / -TC (*TDD*)
- FDMA/TDMA (*DECT*)
- OFDMA TDD WirelessMAN

- Mobile internet & voice/data integration
- Introduction of apps & mobile web browsing

05/2000 – 10/2020

IMT-Advanced

ITU-R M.2012-7

- LTE-Advanced ²
- WirelessMAN-Advanced

- True mobile broadband & All-IP networks
- Seamless HD streaming & mobile gaming

02/2014 – 02/2026

IMT-2020

ITU-R M.2150-3

- 3GPP 5G-SRIT & RIT ⁴
- 5Gi / DECT 5G-SRIT

02/2021 – 02/2026

terrestrial

- Ultra-low latency
- Real-time industry

ITU-R M.2177

- 3GPP 5G-NTN: SRIT & RIT ²

02/2026

satellite

IMT-2030

Res. ITU-R 56-3
(Rev. WRC-23)

- Native AI & integrated sensing (ISAC) ^{??}

2030 ?

Focus & Milestone

Year

1st / latest publication

Market name

“3G”



“4G”



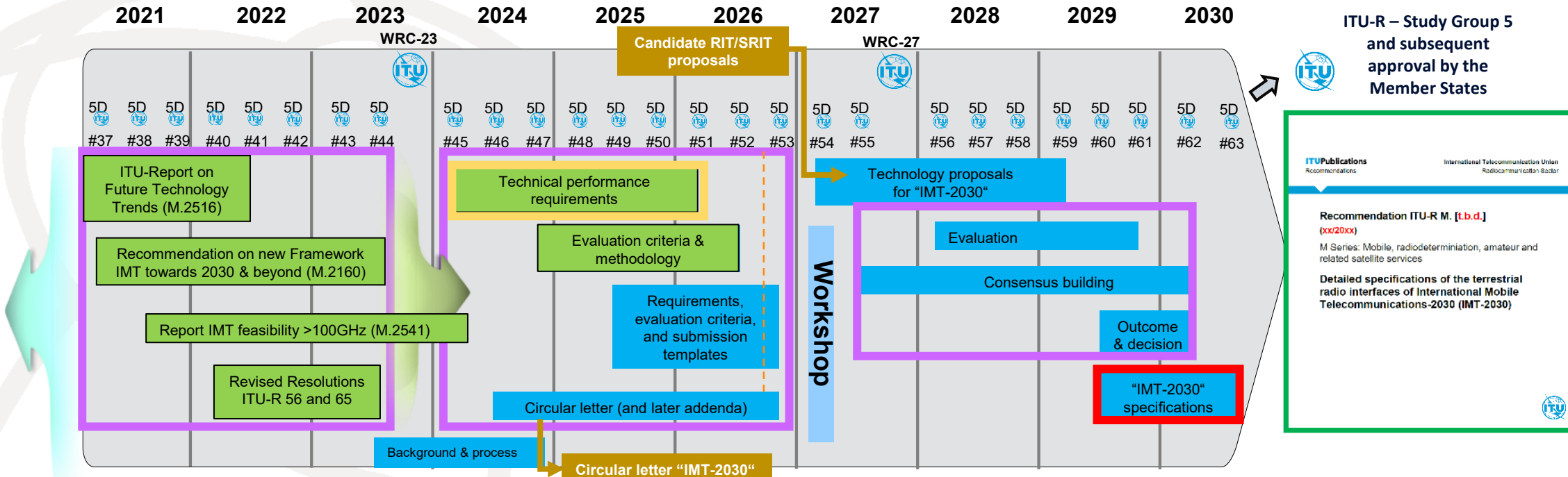
“5G”



“6G”



ITU-R Timeline and Process for IMT-2030



Note 1: WP 5D #59 will additionally organize a workshop involving the Proponents and registered Independent Evaluation Groups (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



The IMT-process itself is a SG/WP-internal activity (incl. LS to EO) and independent from the WRC cycles

IMT-2030 - Drivers

Societal Goals:

- Support UN Sustainable Development Goals like environmental sustainability, healthcare, poverty and inequality reduction, safety, privacy, aging populations, and urbanization.

Market Expectations:

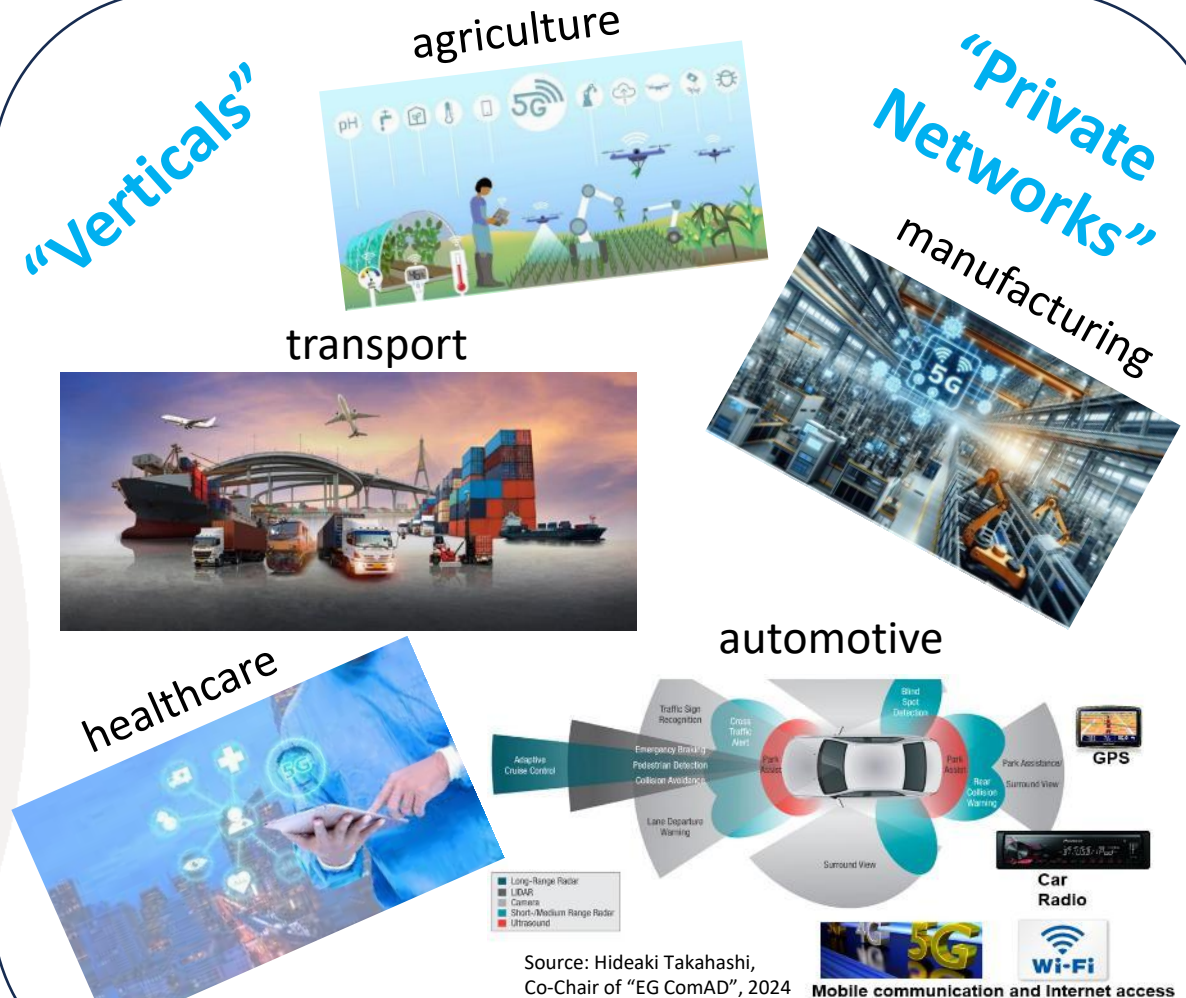
- Enable novel capabilities, new and differentiated services, and expanded market opportunities.

Operational Necessities:

- Manage complexity, drive efficiency, reduce costs with end-to-end automation and visibility.

Innovation as a Core Driver

- Technological evolution and user needs drive innovation in IMT-2030.
- Focus on productivity, connectivity, and efficient management of resources.



Other pictures by Shutterstock

IMT-2030 (6G) – Overall Framework (ITU-R WP 5D)

ITU-R **completed** the initial phase for the development of IMT-2030

- Report ITU-R **M.2516 - Future Technology Trends**
- Report ITU-R **M.2541 - Feasibility of IMT above 100 GHz**
- ① **Recommendation ITU-R M.2160** ●
“Framework and overall objectives of the future development of IMT for 2030 and beyond”

Working Party 5D ([WP 5D](#)) agreed on:

- ② the **technical performance requirements** (TPR) >> 5/116
- ③ the **evaluation guidelines** for potential radio interface technologies (RIT) for IMT-2030 >> 5/119
and
- ④ is now **developing** the draft new Report ITU-R M.[IMT-2030.SUBMISSION] – Requirements and submission templates for the development of IMT-2030

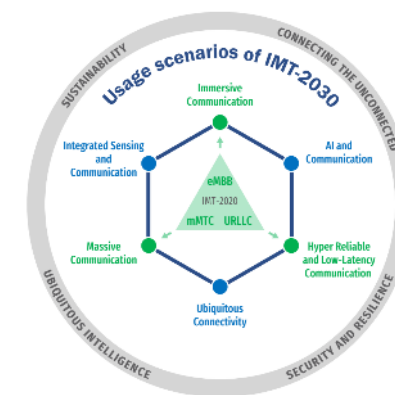
ITU Publications
Recommendations

International Telecommunication Union
Radiocommunication Sector

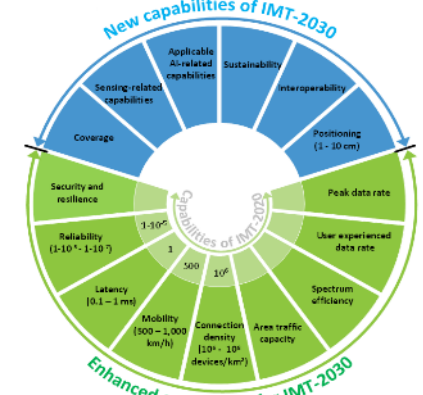
Recommendation ITU-R M.2160-0 (11/2023)

M Series: Mobile, radiodetermination, amateur and related satellite services

Framework and overall objectives of the future development of IMT for 2030 and beyond

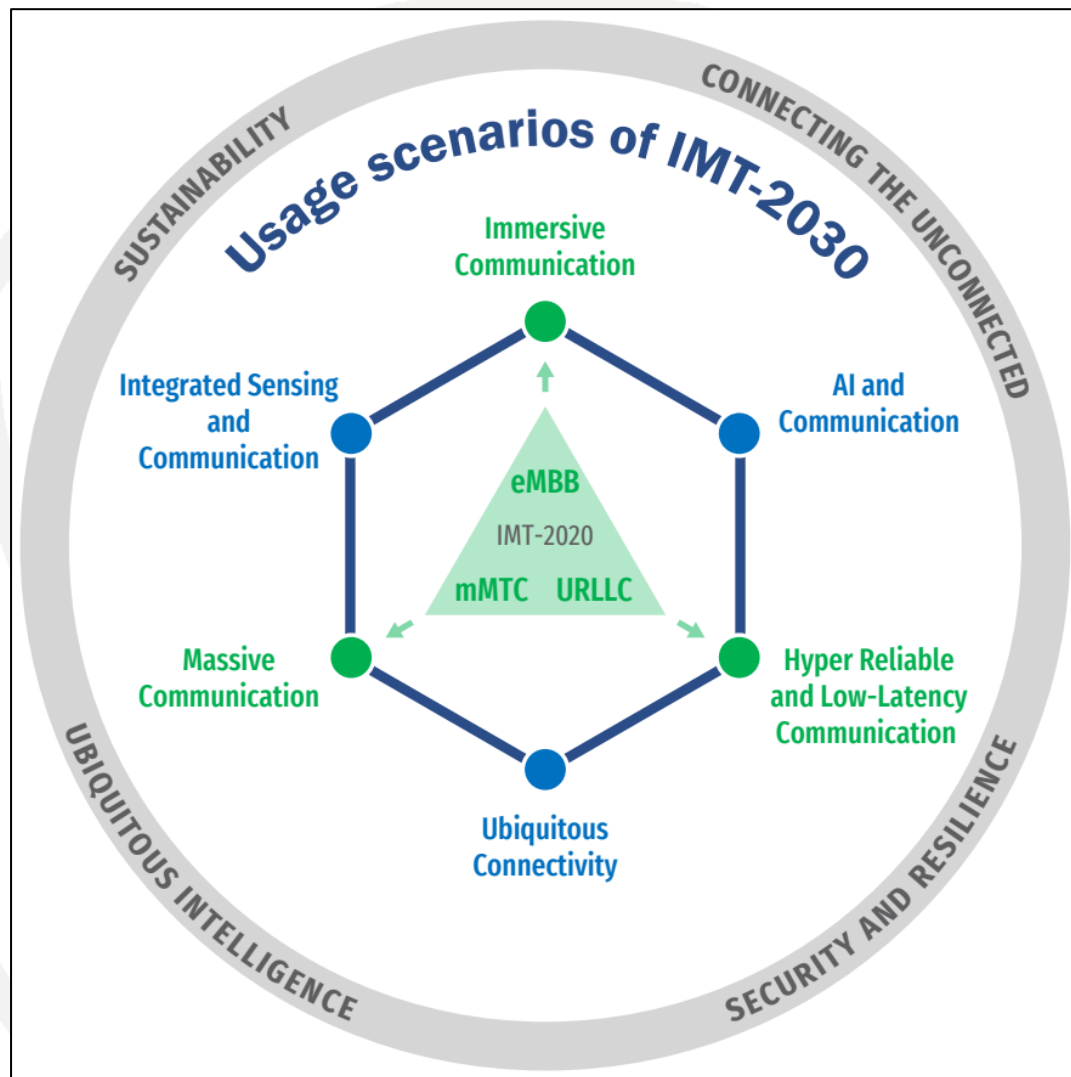


a.k.a. “wheel diagram”



a.k.a. “palette diagram”

① ITU-R M.2160 (§3) - Usage scenarios for IMT-2030



6 Usage scenarios

Extension from IMT-2020 (5G)

eMBB → **Immersive** Communication

mMTC → **Massive** Communication

URLLC → **HRLLC** (Hyper Reliable & Low-Latency Communication)

New

Ubiquitous Connectivity

AI and Communication

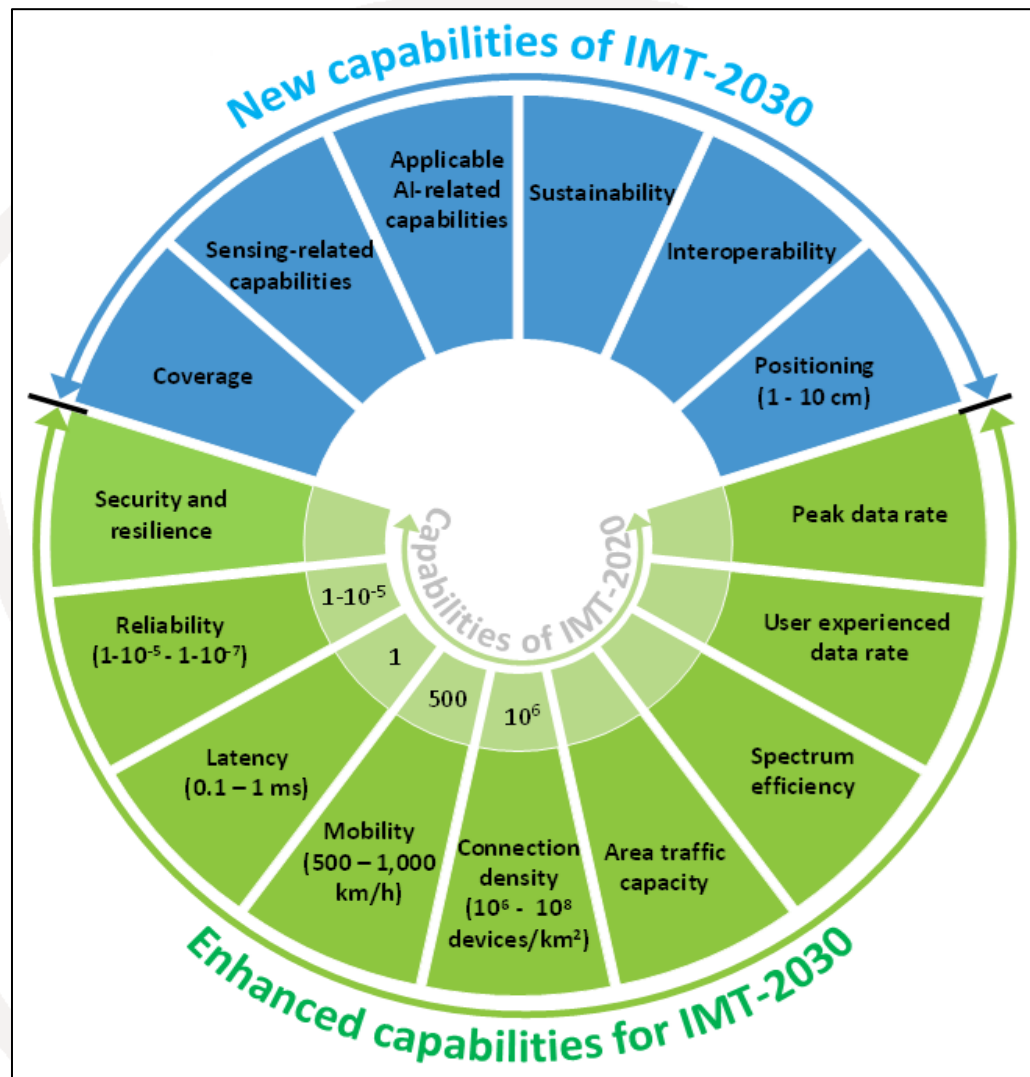
Integrated Sensing and Communication

4 Overarching aspects

act as design principles commonly applicable to all usage scenarios

- Sustainability
- Connecting the unconnected,
- Ubiquitous intelligence,
- Security / resilience

① ITU-R M.2160 (§4) - Capabilities of IMT-2030



IMT-2030 Framework Recommendation identifies **15 capabilities** for 6G technology

- Nine of those capabilities are derived from existing 5G systems

The range of values given for capabilities are estimated targets for research and investigation of IMT-2030

- All values in the range have equal priority in research and investigation
- For each usage scenario, a single or multiple values within the range would be developed in future in other ITU-R Recommendations/Reports

IMT-2030 is also expected to help **address the need for increased environmental, social and economic sustainability**, and also support the goals of the Paris Agreement of the United Nations Framework Convention on Climate Change

② IMT-2030 (6G) minimum technical performance requirements (TPR)

This draft new Report:

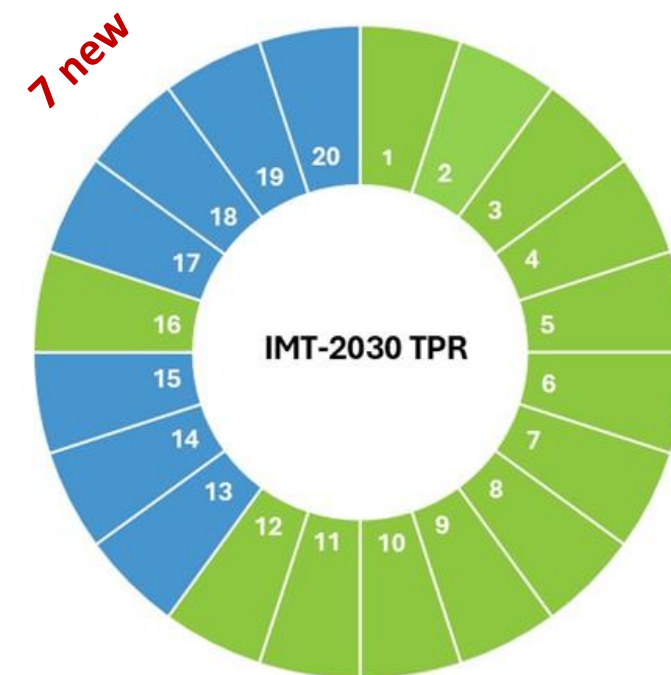
- Defines 20 minimum technical performance requirements
- Provides a consistent basis for specification and evaluation
- Reflects ongoing global research and technology activities
- Supports the further development of the “Guidelines for evaluation of radio interface technologies for IMT-2030” Report ITU-R M.[IMT-2030.EVAL] and further related deliverables

Minimum technical performance requirements

1. Theoretical peak data rate
2. 5th percentile user data rate
3. Peak spectral efficiency
4. Average spectral efficiency
5. 5th percentile user spectral efficiency
6. Area traffic capacity
7. Connection density
8. Mobility
9. Mobility interruption time
10. User plane latency
11. Control plane latency
12. Reliability
13. Composite requirement *new*
14. Link distance *new*
15. Positioning accuracy *new*
16. Bandwidth
17. Sensing-related requirements *new*
18. AI-related requirement *new*
19. Energy efficiency for sustainability *new*
20. Resilience and Extended Connectivity *new*

Detailed TPR, see Annex

The **Draft** new Report was agreed by WP 5D (2/26) and has been submitted to parent SG 5 for its consideration and potential approval in 12/26 (see document [5/116](#))



Feb 2026: WP 5D Draft completed



Dec 2026: SG 5 Approval

② IMT-2030 (6G) TPR DRAFT (!!!)

ITU-R Technical Performance Requirements for IMT-2030

KPIs with numerical requirements

Theoretical peak data rate: 1 36 Gbit/s DL 18 Gbit/s UL Bandwidth: 16 400 MHz	Spectral efficiency (bit/s/Hz): 3,4 Peak: 60/30 DL/UL Avg: Up to ~ 27/20 DL/UL indoors 5%tile: Up to ~ 0.9/0.63 DL/UL indoors 5	5th percentile user data rate: 2 300 / 50 Mbit/s for DL/UL Composite requirement: 13 High capacity for AR-like traffic	Area traffic capacity: 6 40 Mbit/s/m ² (Indoor) Connection density: 7 1 Million devices per km ²	Mobility: 8 Up to 500 km/h, 0.675 bit/s/Hz Mobility Interruption time: 9 Seamless mobility	Latency: 10 UP: 1 ms CP: 20 ms 11 Reliability: 12 1-10 ⁻⁵ success probability	Positioning: accuracy: 15 0.75m/ 6m Indoor/outdoor Sensing Accuracy: 17 2 m/5 m Indoor/outdoor
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Other key capabilities

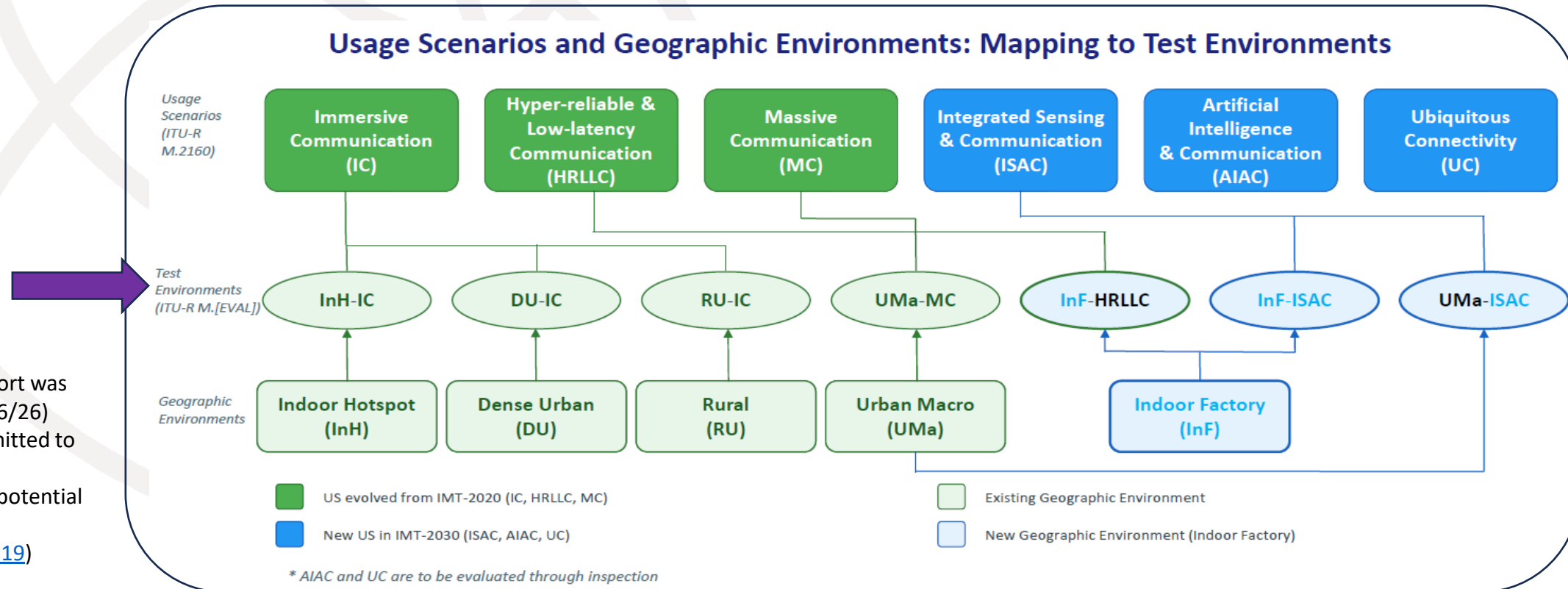
Energy efficiency for sustainability 19 Low relative energy consumption with low and moderate system loads	AI-related requirement 18 Support for data collection, distributed processing and learning, AI model training and inference, and AI computing	Link distance 14 Supportable link distance for a given data rate to be reported	Resilience and extended connectivity Resilient operation in case of e.g. natural disasters 20
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3 Evaluation guidelines for IMT-2030 RIT

Draft new Report "*Guidelines for evaluation of radio interface technologies for IMT-2030*" provides the framework for evaluating candidate IMT-2030 radio interface technologies (RITs/SRITs) against the TPR. It:

- Defines **three evaluation methods** — **simulation, analytical and inspection** — with the applicable method pre-assigned for each technical performance criterion
- Specifies **seven test environments**, including three newly introduced environments (Indoor Factory-HRLLC, Indoor Factory-ISAC, and Urban Macro-ISAC) not present in the IMT-2020 evaluation framework



The Draft new Report was agreed by WP 5D (6/26) and has been submitted to parent SG 5 for its consideration and potential approval in 12/26 (see document [5/119](#))

Technical pillars of IMT-2030

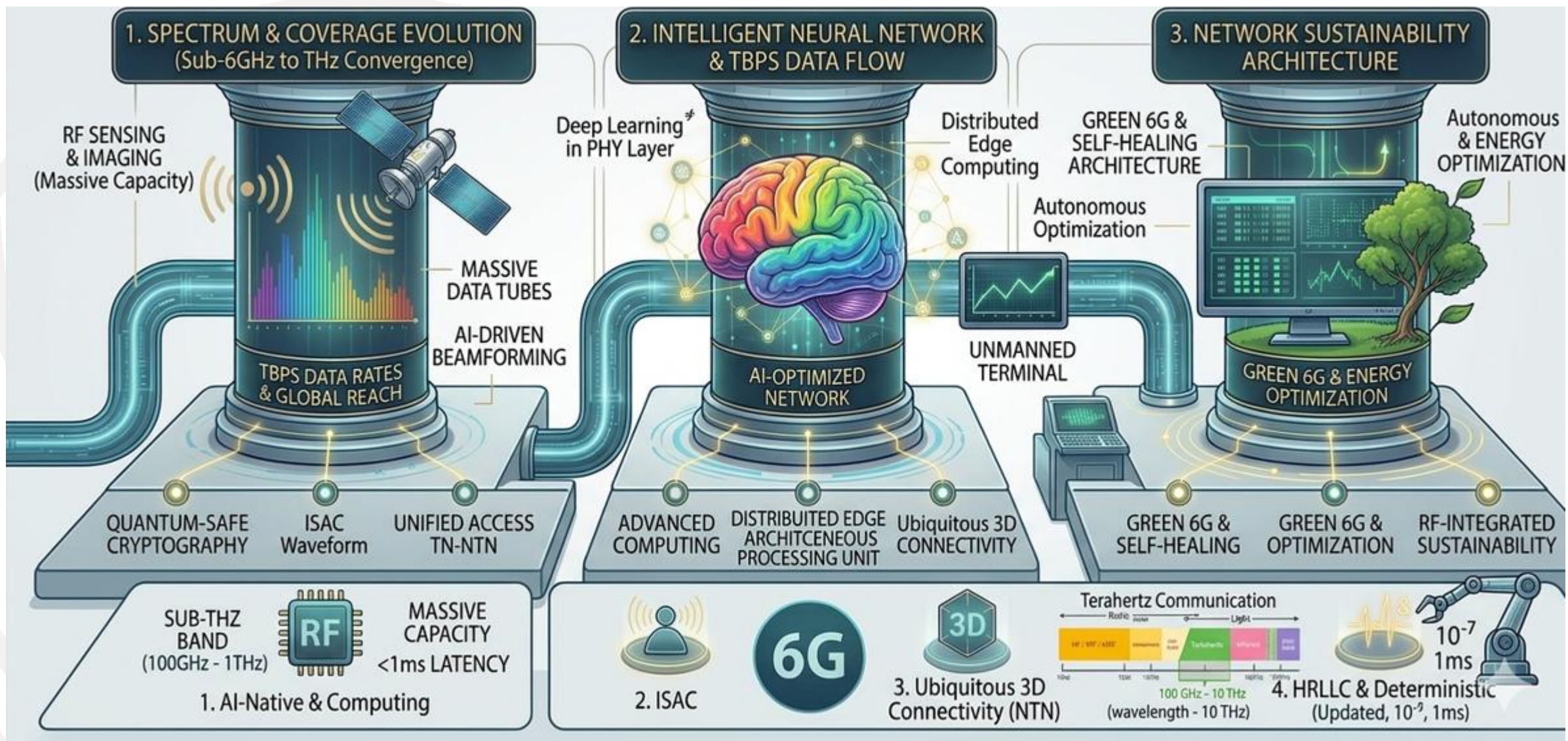


Table comparison 4G >> 6G

	Feature / Aspect	4G (LTE)	5G (Current)	6G (Future, ~2030) *
	Deployment	Since ~2009	Since ~2019	Expected ~2030
	Peak Data Rate	~100 Mbps – 1 Gbps	Up to 10 Gbps	100 Gbps – 1 Tbps (36 Gbps DL / 18 Gbps UL)
	Latency	~50 ms	~1 ms	~0.1 ms
	Spectrum	Below 6 GHz	Sub-6 GHz, mmWave (24–100 GHz)	Terahertz (100 GHz – 1 THz) & mid-bands (6/7-24 GHz)
	Coverage	Wide (urban & rural)	Strong urban, weaker rural	Global (incl. satellites, UAVs, aerial BS)
	Connectivity Density	~100,000 devices/km ²	~1 million devices/km ²	~10 million devices/km ² (1 million devices/km ²)
	AI in Network	Not integrated	AI & edge computing	AI-native, self-optimizing, predictive
	Communication + Sensing	Mainly communication	Limited sensing (positioning, device tracking)	Integrated sensing and communication (ISAC) (env. mapping, digital twins)
	Energy Efficiency	Moderate	Improved vs. 4G	Ultra-efficient, energy-aware networks
	Reliability	High	Very high (99.999%)	Ultra-reliable (near 100%)
	Positioning Accuracy	~10 m	~1 m	~10 cm (75cm indoor / 6m outdoor)
	Applications	Mobile internet, HD streaming, VoIP	AR/VR, IoT, autonomous vehicles, smart cities	Holographic comms, digital twins, tactile internet, BCI
	Vision	Broadband mobile internet	Connected society & Industry 4.0	Fully intelligent, immersive, sustainable global connectivity

* Values of ITU draft minimum "Technical Performance Requirements" (TPR)

IMT-2030 in a glance

Area	5G (IMT-2020)	6G (IMT-2030)	The four truly new elements of 6G
User experience	Mobile broadband services	Immersive communication (AR/VR/XR, holographic services)	Immersive communication (IC): Enable High-quality XR experiences, Digital twins, Holographic communications, tele-medicine, industrial metaverse applications with Hyper-Reliability
Latency	Target around 1 ms	Even lower latency for real-time applications	
Reliability	Ultra-Reliable (URLLC)	Hyper-Reliable Low-Latency Communication (HURLLC)	
AI	AI as an add-on	AI natively integrated into the network	AI enables autonomous network optimization, Distributed AI services
Sensing	Communication only	Communication + sensing/radar functions	ISAC: Network performs communication and sensing simultaneously like gesture recognition, indoor positioning, traffic monitoring
Positioning	Meter-level accuracy	Centimeter-level accuracy targeted	
Coverage	Primarily terrestrial	Integrated terrestrial and satellite networks	Ubiquitous Connectivity by tightly integrate terrestrial mobile networks, Satellites (NTN) and HAPS platforms
Sustainability	Improved vs. 4G	Sustainability and energy efficiency as core design goals	

5G connected things; 6G (IMT-2030) aims to connect the physical, digital and human worlds through AI-native, sensing-enabled and ubiquitous terrestrial/non-terrestrial communications

ITU-R Work on IMT-Satellite/NTN

IMT Satellite Radio Interfaces (NTN) (ITU-R WP 4C)

“The Non-Terrestrial Network (NTN) could complement existing terrestrial mobile networks and enhance the next generation of mobile networks and services, striving to improve connectivity for users in unserved and underserved areas, benefiting both consumers and industries.”

Rec. ITU-R M.2160 “Framework for IMT-2030”

IMT-2020

Radio interface of the satellite component

- Report [ITU-R M.2514](#) - Vision, requirements and evaluation guidelines
- Report [ITU-R M.2543](#) - Evaluation of candidate RITs and SRITs
- New **Recommendation [ITU-R M.2177](#)**

recommends

that the satellite radio interfaces for IMT-2020 should be:

- “3GPP 5G-NTN: SRIT”¹
- “3GPP 5G-NTN: RIT”²

¹ Developed by 3GPP as “5G-NTN, Release 17 and beyond – NR-NTN + IoT-NTN SRIT”

² Developed by 3GPP as “5G-NTN, Release 17 and beyond – NR-NTN RIT”

- ✓ **Standardization:** M.2177 provides the first comprehensive satellite 5G interface standard.
- 📶 **Integration:** Enables seamless roaming between terrestrial and satellite networks.
- 🌐 **Global Access:** Critical for maritime, aviation, and rural broadband services.
- ▶ **Future Ready:** Sets the stage for the transition toward IMT-2030 (6G) satellite components.

From the very beginning of the IMT-development, a satellite component was part of the ITU-R work and a series of ITU-R Recommendations for the satellite component for the according IMT generation has been developed:

IMT-2000

Recs ITU-R [M.818-2](#), [M.1167](#), [M.1182-1](#), [M.1850-2](#) and [M.2014-1](#)

IMT-Advanced

Recommendation ITU-R [M.2047](#)

ITU Publications
Recommendations

International Telecommunication Union
Radiocommunication Sector

Recommendation ITU-R M.2177-0 (02/2026)

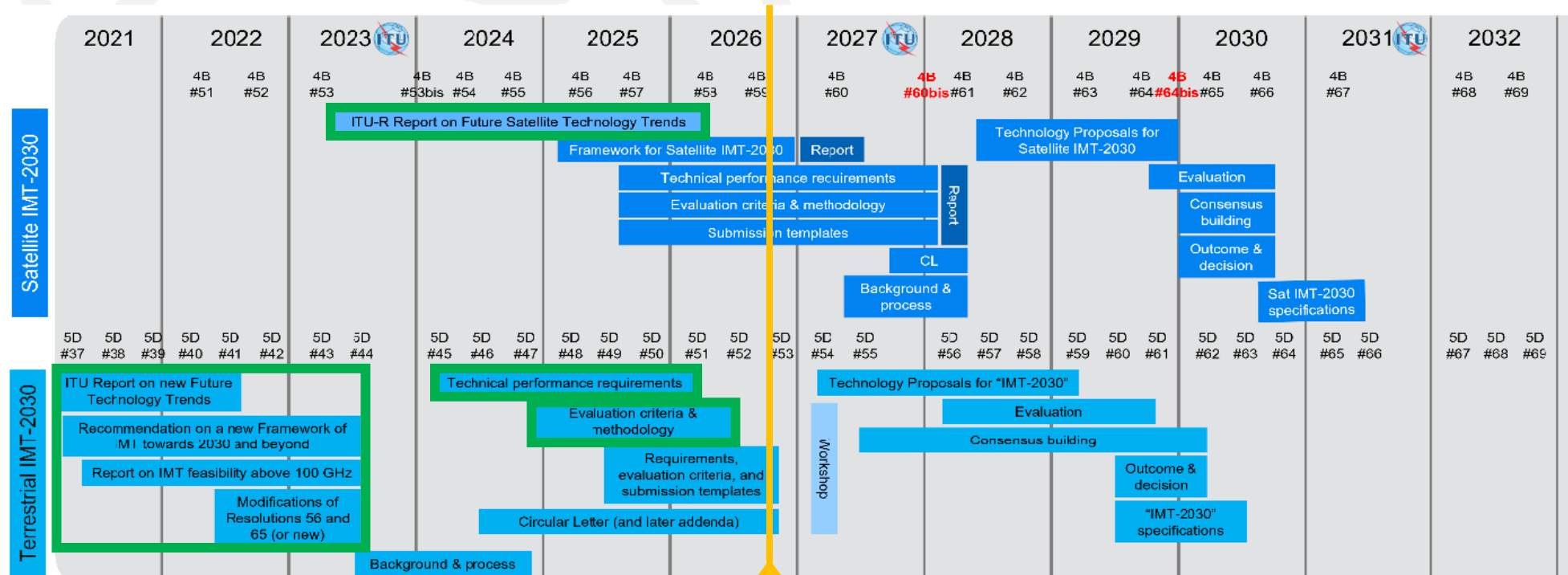
M Series: Mobile, radiodetermination, amateur and related satellite services

Detailed specifications of the satellite radio interfaces of International Mobile Telecommunications-2020 (IMT-2020)

Timeline (IMT-2030 satellite component)

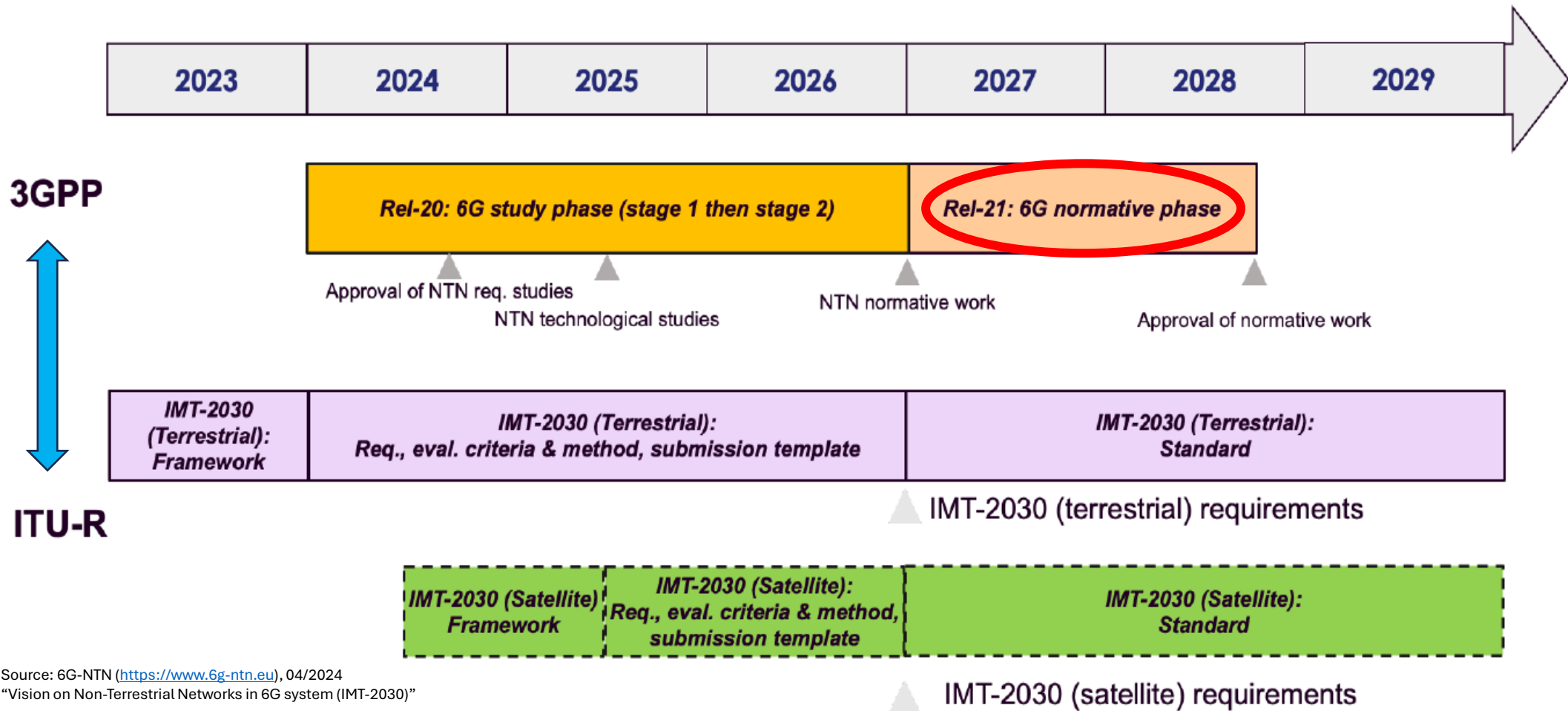
ITU-R ([WP 4B](#)) is also conducting studies on the future development of satellite IMT-2030, including the development of the report on “The framework for satellite radio interfaces of IMT-2030”

- In 05/2025 WP 4B approved the [timeline for the Satellite component of IMT-2030](#) (6G), ensuring the specification keeping pace with Terrestrial component and ready before WRC-31:
- In 02/2026, the report “*Development and technology trends for the satellite component of IMT-2030 and beyond*” ([ITU-R M.2569](#)) was published.



ITU and 3GPP timing is aligned

3GPP standardisation schedule with respect to IMT-2030 definition in ITU-R



Spectrum for IMT

Preamble

- Any spectrum identified for IMT (as part of the Mobile Service - MS) can be used by any of the IMT-generation – **there is NO “6G-spectrum”**
- Nevertheless, depending on the specific use-case, the available ecosystem, the planned service and targeted coverage, specific IMT-bands might be chosen/preferred for IMT-2030/6G



Potential frequency bands for IMT-2030

Multiple frequency ranges would be needed to meet the capacity and coverage requirements of IMT systems and to serve the emerging services and applications in different geographical regions.

Key frequency categories for (terrestrial) spectrum

Low Bands (<1 GHz):

Nationwide coverage, deep indoor access, bridging digital divide.

Mid Bands:

Balance of coverage & capacity.

High Bands (mmWave, THz):

- > new use cases and applications with high data rate and low latency,
- > THz: could accommodate large contiguous bandwidth (tens of GHz)
- > Support data-heavy applications like holographic vision, future XR, capacity backhaul.

3GPP frequency ranges

	Frequency (GHz)	Carrier BW (MHz)	3GPP Rel.
FR1	0,41 - 7,125	5/10/.../50/100	Rel.15 (2018)
FR3	7,125 - 24,25	200/400	study item (Rel.18)
FR2	24,25 - 71	50/100/200/400	Rel.15 (2018)

3GPP frequency bands for NTN

S-Band / L-Band	2 GHz / 1.6 GHz	Rel.17	3GPP operating bands are defined in all satellite spectrum <3 GHz (~100 MHz)
Ka-Band	20/30 GHz	Rel.18	
Ku-Band	12/14 GHz	Rel.19	

WRC-27, AI 1.13

MSS (D2D) in terr. IMT-bands between 694/698 MHz to 2.7 GHz

WRC-27 agenda items addressing IMT

WP 5D

1.7

WRC-27 IMT bands under consideration

Region 1	Region 2	Region 3
4 400-4 800 MHz		4 400-4 800 MHz
7 125-7 250 MHz 7 750-8 400 MHz	7 125-8 400 MHz	7 125-8 400 MHz
14.8-15.35 GHz	14.8-15.35 GHz	14.8-15.35 GHz

WP 4C

1.12

1.13

1.14

WRC-27 Mobile-satellite service (MSS) bands under consideration

 AI 1.13 Direct to Device	 New Mobile Satellite
Mobile satellite in IMT bands between 694/698 MHz and 2.7 GHz	1 427-1 432 MHz 1 645.5-1 646.5 MHz 1 880-1 920 MHz 2 010-2 025 MHz 2 120-2 170 MHz

From:
 "Spectrum Policy Trends 2024",
 GSMA, 02/2024

3x Vision / Framework in ITU-R

Satellite (ITU-R SG 4)

- Report [ITU-R M.2569](#) - “Development and technology trends for the satellite component of IMT towards 2030 and beyond”



Broadcasting (ITU-R SG 6)

Note: ITU-R SG 6 Workshop (23.9.26)

- Report [ITU-R BT./BS.2522](#) - “A framework for the future of broadcasting”
- Report [ITU-R BT./BS.2524](#) - “A framework for future of broadcast production”



IMT (ITU-R SG 5)

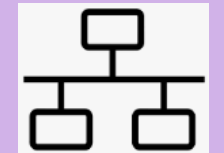
- Recommendation [ITU-R M.2160](#) - “Framework and overall objectives of the future development of IMT for 2030 and beyond”



ITU-T SG 13

Future networks and emerging network technologies

- [ITU-T Y.3100](#) (09/17) - Terms and definitions for IMT-2020 network
- [ITU-T Y Suppl. 59: Y.3100-series](#) (11/22) - IMT-2020 standardisation roadmap
- [ITU-T Question 20/13](#) - “IMT networks and AI/ML: Requirements and architecture”
- [ITU-T Question 23/13](#) - “IMT-2030 networks: Fixed, mobile and satellite convergence”
- [Recommendation ITU-T Y.3216](#) “Fixed, Mobile and Satellite convergence – distributed core network for IMT-2020 networks and beyond” (09/24)

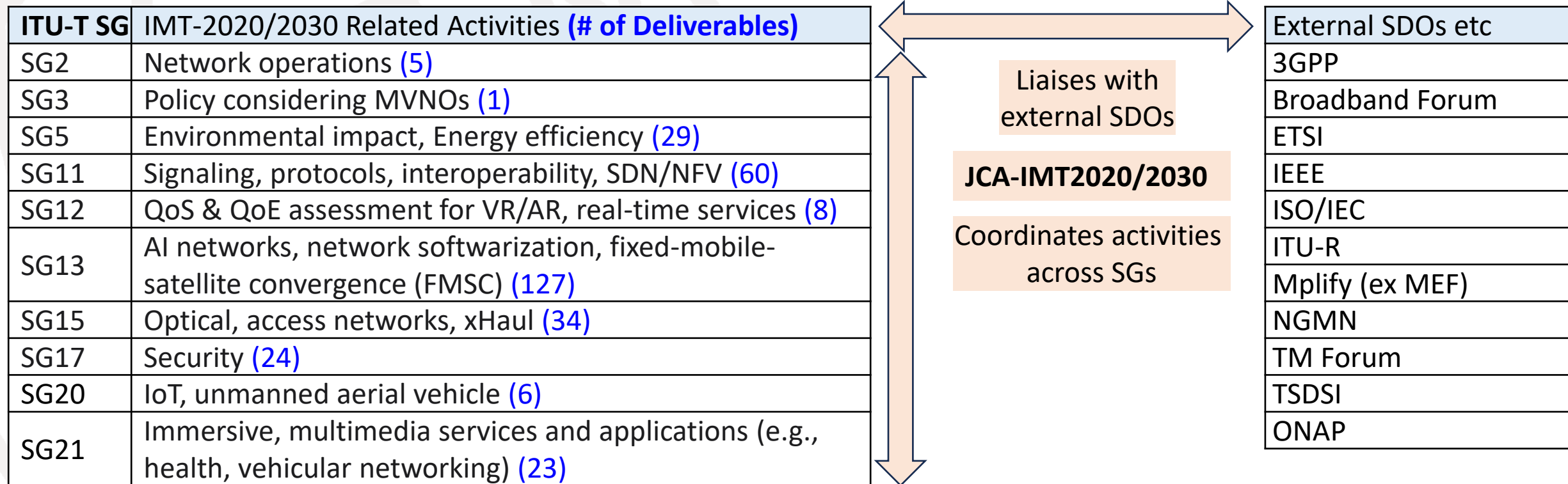


Study Period 2025-2028

- Addressing emerging issues e.g. Integrated Sensing & Communication (ISAC) and Network Digital Twins

ITU-T's Study Groups and IMT-Related Activities

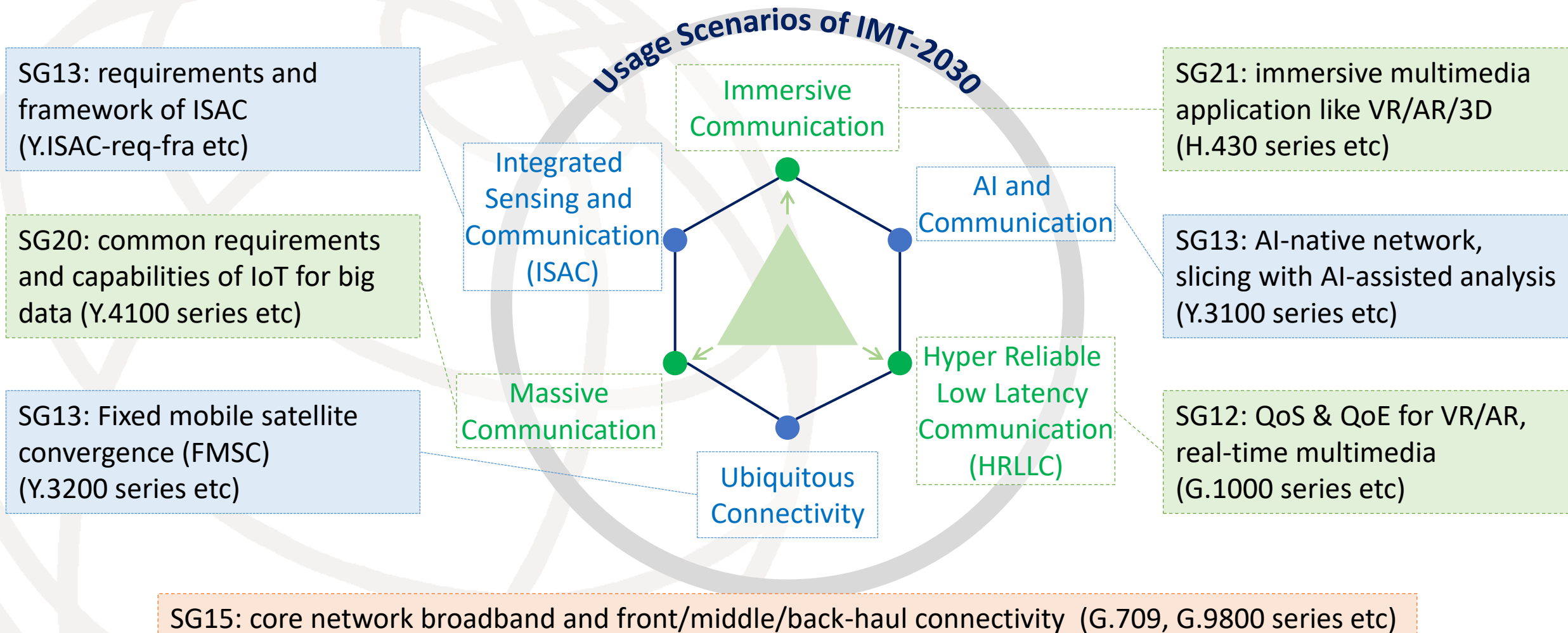
- The **10 ITU-T SGs** are each advancing “non-radio” IMT-related activities, resulting in a total of **317 deliverables**
- JCA-IMT2020/2030** oversees cross-functional coordination among the ITU-T 10 SGs and facilitates liaison with external collaborating SDOs



- JCA-IMT2020/IMT2030 roadmap (ITU-T landscape for ICT standards): <https://itu.int/itu-t/landscape/?topic=tx379&group=gx0>

ITU-T's Key Initiatives for IMT-2030 with the 6 Usage Scenarios

- The ITU-T key initiatives will enable the six “Usage Scenarios of IMT-2030” and provide 6G/IMT foundational networking



ITU-D: ITU-D Study Groups

SG1 and SG2 provide a development and deployment perspective that complements [ITU-T](#) and [ITU-R](#) work on future networks, helping translate future network evolution into affordable, inclusive and meaningful connectivity and digital transformation outcomes for developing countries.

- Future networks in developing countries: [SG1 Q1/1](#) has an established intersectoral linkage with ITU-T SG13 Q5/13 on Applying future networks and innovation in developing countries
- [IMT-2020 and beyond](#): SG1 Q1/1 is also mapped to SG13 work on QoS in networks beyond IMT-2020, AI for IMT, digital twins, and fixed-mobile-satellite convergence, providing concrete links to technologies relevant to future network evolution.
- Emerging technologies: [SG2 Q5/2](#) addresses the adoption and utilization of new and emerging telecommunication/ICT services and technologies (like AI), and the development of digital skills, which are also relevant to 6G.
- Development and deployment perspective: These intersectoral linkages provide a channel for bringing developing-country deployment considerations into future-network discussions, including implications for connectivity in underserved and remote areas.
- Early engagement: As the 6G ecosystem evolves, ITU-D Study Groups provide a platform for developing countries to follow emerging developments, exchange experiences and bring forward their policy, deployment and capacity needs.

ITU-D: BDT RME – Digital Regulation Platform

The RME team is working closely with BR on articles which can be of use to regulators. As such, we have published a number of articles on the Digital Regulation Platform that are relevant to this work

- [Overview of 6G \(IMT-2030\) | Digital Regulation Platform](#)
- [Technical standards for upcoming technologies | Digital Regulation Platform](#)
- [Spectrum management: Key applications and regulatory considerations driving the future use of spectrum | Digital Regulation Platform](#)
- [Technology innovations driving new spectrum demand | Digital Regulation Platform](#)
- [The role of the regulator on national spectrum issues | Digital Regulation Platform](#)
- [Overview of national spectrum licensing | Digital Regulation Platform](#)

ITU-D: ITU Academy 6G-related Training Courses

In the second half of 2026, the ITU Academy is offering a range of paid courses covering 6G and related technologies. These courses are designed and delivered by ITU Academy Training Centres.

- [Future fixed and mobile broadband Internet, Cloud Computing and IoT/AI](#) (*Online instructor-led | 21 to 28 September 2026*)
- [5G-Advanced mobile broadband and future services](#) (*Online instructor-led | 17 to 24 August 2026*)
- [Advanced multi-global navigation satellite systems: technical foundations and economic applications](#) (*Online instructor-led | 19 to 30 October 2026*)
- [AI, cybersecurity and QoS/QoE for future mobile broadband](#) (*Face-to-face | 22 to 23 October 2026*)
- [Technical, business and regulatory aspects of Artificial Intelligence and Metaverse for future Internet and telecoms](#) (*Online instructor-led | 30 November to 07 December 2026*)

Summary

- The “Framework Recommendation” ITU-R M.2160 for IMT-2030 (06/23) describes the overall objectives including use cases, setting the basis for the development of IMT-2030.
- The satellite component of IMT (“NTN”) has always been a part of the IMT-development, but now - with the evolution of underlying satellite technologies - the development of the satellite component for IMT-2020 (ITU-R M.2177) and IMT-2030 will enable the delivery of IMT-service to those places where it is technically difficult or too expensive to deliver with a terrestrial network.
- Complemented by the work of ITU-T and ITU-D, ITU is providing a holistic approach with standards and regulation for the development and future deployment of IMT-2030.

- 6G (IMT-2030) aims to connect the physical, digital and human worlds through AI-native, sensing-enabled and ubiquitous terrestrial/non-terrestrial communications
- There is NO “6G-spectrum” - any spectrum identified for IMT can be used by any IMT-generations. Nevertheless, 6G may prefer certain spectrum parts, based on requirements
- ITU-T Study Groups have key Initiatives related to all 6 usage scenarios towards IMT-2030



ITU – Radiocommunication Bureau

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Annexes

- Helpful links
- Technical comparison 4G >> 6G
- Bands identified for terrestrial IMT
- Details about WRC-27, AI 1.7
- Reference to relevant ITU-R documents across the IMT generations (terr. & sat.)
- Wavelength, frequency, “spectrum for IMT”

Helpful links

More about ITU <https://www.itu.int/en/about/Pages/default.aspx>

ITU-Journal on Future and Evolving Technologies <https://www.itu.int/en/journal/j-fet/Pages/default.aspx>

More about IMT-2030

<https://www.itu.int/en/ITU-R/study-groups/rsg5/rwp5d/imt-2030/Pages/default.aspx>

Details about IMT-2020 submission & evaluation (ITU-R M.2150 Rev.3)

<https://www.itu.int/en/ITU-R/study-groups/rsg5/rwp5d/imt-2020/Pages/submission-eval-3rd-release.aspx>

Details about Satellite IMT-2020 submission and evaluation process

<https://www.itu.int/en/ITU-R/study-groups/rsg4/Pages/imt-2020-sat-submission-eval.aspx>

SG 4 <https://www.itu.int/en/ITU-R/study-groups/rsg4/Pages/default.aspx>

WP 4B <https://www.itu.int/en/ITU-R/study-groups/rsg4/rwp4b/Pages/default.aspx>

SG 5 <https://www.itu.int/en/ITU-R/study-groups/rsg5/Pages/default.aspx>

WP 5D <https://www.itu.int/en/ITU-R/study-groups/rsg5/rwp5d/Pages/default.aspx>



REC. ITU-R M.2150 (IMT-2020)

<https://www.itu.int/rec/R-REC-M.2150/en>

REC. ITU-R M.2177 (IMT-2020 SAT RIT)

<https://www.itu.int/rec/R-REC-M.2177/en>

REC. ITU-R M.2160 (IMT-2030)

<https://www.itu.int/rec/R-REC-M.2160>

Rep. ITU-R M.2541 (IMT > 100 GHz)

<https://www.itu.int/pub/R-REP-M.2541>

Bands identified for terrestrial IMT

Frequency Bands identified for IMT (MHz)	Footnotes identifying the band for IMT in the Radio Regulations			Available Bandwidth (MHz)	Timing
	Region 1	Region 2	Region 3		
450-470	5.286AA			20	WRC-07
470-698	5.307A**	5.295** 5.308A**	5.296A**	228	WRC-15/23
694/698-960	5.317A	5.317A	5.313A** 5.317A	262	WRC-07/2000
1 427-1 518	5.341A, 5.346**	5.341B	5.341C, 5.346A	91	WRC-15
1 710-2 025	5.384A, 5.388			315	WARC-92, WRC-2000
2 110-2 200	5.388			90	WARC-92
2 300-2 400	5.384A			100	WRC-07
2 500-2 690	5.384A			190	WRC-2000
3 300-3 400	5.429B**	5.429D	5.429F**	100	WRC-15/23
3 400-3 600	5.430A	5.431B	5.432A** 5.432B** 5.433A**	200	WRC-07
3 600-3 700	5.433B, ** 5.434B**	5.434	-	100	WRC-15/23
3 700-3 800 *	5.434B**	5.435B**	-	100	WRC-23
4 800-4 990	5.441B**	5.441A** 5.441B**	5.441B**	190	WRC-15
6 425-7 025 *	5.457E	5.457F**	5.457D**	600	WRC-23
7 025-7 125 *	5.457E	5.457F**	5.457E	100	WRC-23
10 000-10 500 *		5.480A		500	WRC-23
24 250-27 500	5.532AB			3250	WRC-19
37 000-43 500	5.550B			6500	WRC-19
45 500-47 000	5.553A**			1500	WRC-19
47 200-48 200	5.553B**			1000	WRC-19
66 000-71 000	5.559AA			5000	WRC-19

Reference Documents:

Recommendation [ITU-R M.1036](#) and [RR edition 2024](#)

List of frequency bands under WRC-27 agenda items (considered by ITU-R WP 5D)

Frequency bands	WRC-27 agenda items
608-614 MHz	1.17
694/698-960 MHz	1.13
1 427-1 518 MHz	1.12 (1 427-1 432 MHz), 1.13
1 710-1 785 MHz	1.13
1 805-2 025 MHz	1.12 (1 880-1 920 MHz, 2 010-2 025 MHz), 1.13, 1.14 (2 010-2 025 MHz)
2 110-2 200 MHz	1.13, 1.14 (2 120-2 170 MHz)
2 300-2 400 MHz	1.13
2 500-2 690 MHz	1.13 1.15
3 500-3 600 MHz	1.15
3 600-3 800 MHz	1.15
4 400-4 800 MHz	1.7 1.19 (4 200-4 400 MHz)
7 125-8 400 MHz	1.7 1.15 (7 190-7 235MHz) 1.19 (8 400-8 500 MHz)
14.8 – 15.35 GHz	1.7
25.25-28.35 GHz	1.15
37-43.5 GHz	1.6
47.2-48.2 GHz	1.1, 1.6

(Table 1 in Annex 4.9 to Document 5D/242)

* this band is identified for IMT from 01.01.2025 ** this band is identified in some countries of the Region

WRC-27 Agenda Item 1.7

RESPONSIBLE: WP5D

→ Next meeting: 28.9.-8.10.26

Deadline draft CPM-text: 23.10.26

WP 5D should develop technical conditions for possible IMT identification in 4 400-4 800 MHz, 7 125-8 400 MHz and 14.8-15.35 GHz, ensuring protection of existing primary services in these and adjacent bands.

ONGOING DISCUSSIONS ON TECHNICAL ASPECTS TO ADDRESS:

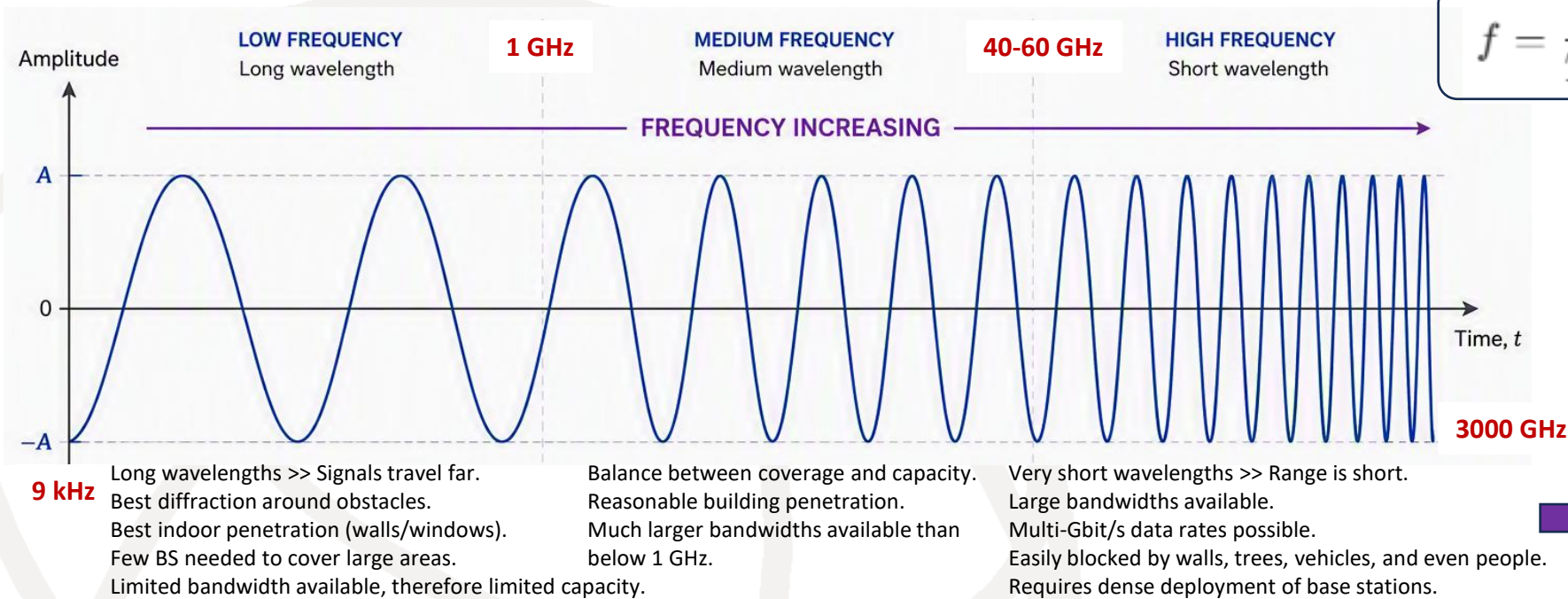
Sharing and compatibility studies to enable possible IMT identification while protecting existing primary services, without imposing additional constraints on them, comprising:

- Reconciling differing assumptions and resulting separation/coordination distance and protection-margin calculations into agreed study results;
- Treatment of incumbent-to-IMT interference in relation to IMT-to-incumbent sharing studies;
- Harmonization of aggregate-interference methodologies across candidate bands;
- Development of appropriate technical and regulatory conditions for inclusion in CPM text.

References to relevant ITU-R documents

	ITEM	IMT-2000	IMT-Advanced	IMT-2020		IMT-2030	
				terrestrial	satellite	terrestrial	satellite
REC.	TREND	—	M.2038	M.2320	—	M.2516	M.2569
	Year	—	2004	2014	—	2022	2026
	Pages	—	24	18	—	44	21
	FRAMEWORK	M.687 & M.816	M.1645	M.2083	M.2514 §6	M.2160	
	Year	1992	2003	2015	2022	2023	
	Pages	29	24	19	6	19	
	REQUIREMENTS	M.1034	M.2134	M.2410	M.2514 §7	5/116 (draft)	
	Year	1997	2008	2017	2022	2026*	
	Pages	28	8	9	8	[14]	
	SUBMISSION	8/LCCE/47 + Add	M.2133	M.2411	—	TBD	
REC.	Year	1998	2008	2017	—	2026*	
	Pages	10	29	28	—		
	EVALUATION	M.1225	M.2135	M.2412	M.2514 §8, M.2543	5/119 (draft)	
	Year	1997	2009	2017	2022, 2024	2026*	
	Pages	61	70	137	13, 10	[90]	
	SPECIFICATIONS	M.1457	M.2012	M.2150	M.2177	TBD	
	Year	2000	2012	2021	2026	~2030	
	Current Version	M.1457-15	M.2012-7	M.2150-3	M.2177-0	—	
	Year	2020	2026	2026	2026	—	

Wavelength, frequency, “spectrum for IMT”



$$f = \frac{1}{T}$$

• f = frequency (Hz)
• T = period (s)

Frequency	Wavelength
9 kHz	~33 km
3 MHz	100 m
300 MHz	1 m
3 GHz	10 cm
300 GHz	1 mm
3000 GHz (3 THz)	0.1 mm (100 μm)

As frequency increases, coverage and penetration decrease, while available bandwidth and network capacity increase

Related to the Radio Regulations (RR), **International Mobile Telecommunications (IMT)** has a special role:

- In the RR (Article 5), spectrum is **allocated** to a specific Radiocommunication Service, e.g. MS (Mobile Service), MSS (Mobile Satellite Service). Commercial cellular networks (3G-6G) operate under the umbrella of the MS (*so far*).
- WRC’s **identify** specific frequency bands for IMT through Article 5 Footnotes (and cross-referenced ITU-R Resolutions).
- A key principle of ITU regulation is technology neutrality. Hence:
 - Any spectrum identified for IMT (as part of the MS) can be used by any of the IMT-generation – **there is NO “6G-spectrum”**
 - Nevertheless, depending on the specific use-case, the available ecosystem, the planned service and targeted coverage, specific IMT-bands might be chosen/preferred for IMT-2030/6G

9 kHz - 3000 GHz

