1. Question: What does IMT stand for?

IMT stands for "International Mobile Telecommunications'.

The term **I**nternational **M**obile **T**elecommunications (**IMT**) is the generic term used by the ITU community to designate broadband mobile systems. It encompasses IMT-2000, IMT- Advanced, IMT- 2020 and IMT-2030 collectively, respectively called 3G, 4G, 5G and 6G by the market. The official definitions can be found in Resolution ITU-R 56 "Naming for International Mobile Telecommunications".

Through its 194 Member States, 284 Sector members, 43 Associate members and 169 Academia members, the ITU-R develops and adopts the international regulations and global standards which, through their worldwide application, enable the harmonization and implementation of broadband mobile networks (3G, 4G, 5G and now 6G) throughout the World.

2. Question: What is ITU's role in IMT?

The ITU Radiocommunication Sector (ITU-R) develops and adopts the international regulations on the use of the radiofrequency spectrum, the Radio Regulations (RR). To take into account the progress of technologies and the changes in spectrum usages, the RR are updated every four years by the ITU World Radiocommunication Conference (WRC). The RR are an international treaty that is binding on the 194 Member States of the ITU. It is the basis for the harmonization of IMT spectrum worldwide.

The ITU-R also develops and adopts the global standards for the overall requirements of IMT and for its radio interface (ITU-R Recommendations), as well as best practices in the implementation of these standards and regulations (ITU-R Reports and Handbooks).

The ITU Telecommunication Standardization Sector (ITU-T) develops and adopts global standards for the IMT core network (ITU-T Recommendations).

These developments take place through extensive studies and discussions involving all stakeholders from governments, regulators, industry (incl. partnership with external standards development organizations) and academia, which are conducted by the ITU-R Study Groups and ITU-T Study Groups in their respective fields.

Through this work, since 1990, ITU has been leading international efforts to enable mobile broadband communications (3G, 4G, 5G and now 6G).

3. Question: What is IMT-2000, IMT-Advanced, IMT-2020 and IMT-2030?

All mobile broadband systems (3G, 4G, 5G and soon 6G) are based on the ITU's IMT standards.

The initial set of IMT standards was approved by ITU in the year 2000 and called **IMT-2000**. The first 3G deployments commenced shortly after on this basis.

In January 2012, ITU defined the 4G wireless cellular technology, **IMT-Advanced** which has been deployed nearly worldwide.

In February 2021, the development of the standards for the 5th generation, **IMT-2020**, was concluded and meanwhile more than 300 commercial launches across the world [1] and more than 2700 announced devices (at least 50% already commercially available) [2]can be noted.

Late 2021, ITU-R started the development of the 6th generation of terrestrial mobile communication, called **IMT-2030** and in December 2023, ITU published the framework for the development of standards and radio interface technologies for the sixth generation of mobile systems, popularly referred to as 6G (contained in Recommendation ITU-R M.2160).

From the very beginning of the IMT-development, a potential satellite component was part of the consideration and work of the ITU-R Membership, which resulted in the preparation of various Recommendations and Reports (see Q.11), including ITU-R Recommendations with the detailed specifications of the radio interfaces for the satellite component of IMT-2000 and IMT-Advanced. The work for IMT-2020 is ongoing and the "Framework Recommendation" for IMT-2030 (ITU-R M.2160, section 5.1.2) states that "*External standards developing organizations involved in the development of IMT radio interface technologies have ongoing standardization activities that facilitate IMT interworking with non-terrestrial networks of IMT (including satellite communication systems, HIBS and UASs), as well as with other non-IMT terrestrial networks (including RLAN and broadcast).*"

The work on the terrestrial component and the satellite component of IMT is shared within ITU-R between Working Party 5D (ITU-R WP 5D) and Working Party 4B (ITU-R WP 4B), respectively.

Overall, IMT provides the global platform on which to build the next generations of mobile broadband connectivity. More details on the IMT-generations can be found on the dedicated ITU-R website "Detailed information about the IMT- family".

In addition, the "Handbook on International Mobile Telecommunications (IMT)" is available. Initially published in 2015, it was updated in 2022, but does not yet contain information on IMT-2030 (6G).

4. Question: What technology is IMT-2000, IMT-Advanced, IMT-2020 and IMT-2030?

IMT standards are not specific technologies, but rather specifications and requirements for high- speed mobile broadband service, taking into account what technology is expected to provide in the corresponding timeframe. ITU defined the process of evaluation and the subsequent selection of mobile technologies that fulfill several established technical parameters (peak data rate, latency, spectrum efficiency, etc.).

So far, four generations of IMT have been defined: IMT-2000 (3G), IMT-Advanced (4G), IMT-2020 (5G) and IMT-2030 (6G). For each generation the IMT-process agreed by ITU has been applied, undergoing preparing a vision/framework, defining the minimum requirements, evaluating potential candidates and following a consensus phase approving the final specification – for IMT-2030, as of July 2024, ITU completed the framework and is currently working on the requirements and evaluation criteria.

The requirements for IMT standards for 5G (**IMT-2020**) has been agreed in close collaboration with the mobile broadband industry and the wide range of stakeholders in the 5G community.

[1] "Ericsson Mobility Report June 2024": https://www.ericsson.com/en/reports-and-papers/mobility-report/reports/june-2024
[2] "GSA Analyser for Mobile Broadband Databases" (GAMBoD): https://gsacom.com/gambod

In this regard, **IMT-2020** systems are mobile systems that include the new capabilities of **IMT** that go beyond those of IMT-Advanced which would make **IMT-2020** more efficient, fast, flexible, and reliable when providing diverse services in the intended usage scenarios.

The procedure, the methodology and the criteria (technical, spectrum and service) to be used in evaluating the candidate **IMT-2020** radio interface technologies (RITs) or set of RITs (SRITs) have been applied through a number of tests throughout the World, in order to simulate closely the more stringent radio operating environments. The evaluation procedure is designed in such a way that the overall performance of the candidate RITs/SRITs may be fairly and equitably assessed on a technical basis. It ensures that the overall **IMT-2020** objectives were met.

Further enhancements will become available as part of the started activities on **IMT-2030**.

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5. Question: Which technologies meet the IMT criteria and specification?

The technologies that meet **IMT-2000** criteria and specifications are:

1- IMT-2000 CDMA Direct Spread
2- IMT-2000 CDMA Multi-Carrier
3- IMT-2000 CDMA TDD
4- IMT-2000 TDMA Single-Carrier
5- IMT-2000 FDMA/TDMA
6- IMT-2000 OFDMA TDD WMAN

Right now, two technologies have been found to **meet the IMT-Advanced** criteria and specifications:

1- LTE-Advanced
2- WirelessMAN-Advanced

ITU has determined that "LTE-Advanced" and "WirelessMAN-Advanced" should be accorded the official designation of IMT-Advanced. These are extensions of the LTE (IMT-2000 CDMA Direct Spread) and WiMax (IMT-2000 OFDMA TDD WMAN) technologies.

Initially, three technologies were meeting **IMT-2020** specifications – a fourth technology has been included in February 2022, after the successful evaluation by a number of evaluation groups worldwide.

1- 3GPP 5G-SRIT
2- 3GPP 5G-RIT
3- 5Gi
4- DECT 5G-SRIT

6. Question: What are the key features of IMT-2000 and IMT-Advanced systems?

Key features of **IMT-2000 and IMT-Advanced** systems:

- a high degree of commonality of functionality worldwide while retaining the flexibility to support a wide range of services and applications in a cost efficient manner;
- compatibility of services within IMT and with fixed networks;
- capability of interworking with other radio access systems;
- high quality mobile services;
- user equipment suitable for worldwide use;
- user-friendly applications, services and equipment;
- worldwide roaming capability; and,
- enhanced peak data rates to support advanced services and applications: Initially peak data rates of 100 Mbit/s for high and 1 Gbit/s for low mobility were established as targets for IMT-Advanced systems.

These features enable IMT-2000 and IMT-Advanced to address evolving user needs and the capabilities are being continuously enhanced in line with user trends and technology developments.

Note: Key features of IMT-2020 can be found within the questions about IMT-2020 (see question 17) and initial consideration related to IMT-2030 and its capabilities can be found in the section "What can be expected from IMT-2030 (see question 21).

7. Question: What is the Vocabulary of terms for IMT?

This is available in Recommendation ITU-R M.1224.

Note: The latest version (March 2012) does not yet contain IMT-2020 nor IMT-2030 terminology and is still based on IMT-Advanced. An update is envisaged from the responsible Working Party (ITU-R WP 5D) in due course.

8. Question: Where can I find the full list of ITU-R Reports on IMT?

IMT-relevant ITU-R Reports can be found at:
https://www.itu.int/en/ITU-R/study-groups/rsg5/rwp5d/Pages/ITU-R-Reports-on-IMT.aspx

All ITU-R Reports can be found at:
https://www.itu.int/pub/R-REP

Detailed information about the IMT-family can be found here:
https://www.itu.int/en/ITU-R/study-groups/rsg5/rwp5d/Pages/IMT.aspx

9. Question: Where can I find the full list of ITU-R Recommendations (standards or specifications) on IMT?

IMT-relevant ITU-R Recommendations can be found at:
https://www.itu.int/en/ITU-R/study-groups/rsg5/rwp5d/Pages/ITU-R-Recommendations-on-IMT.aspx

All ITU-R Recommendations can be found at:
https://www.itu.int/pub/R-REC

Detailed information about the IMT-family can be found here:
https://www.itu.int/en/ITU-R/study-groups/rsg5/rwp5d/Pages/IMT.aspx

10. Question: What Specifications for IMT are available in ITU-R Recommendations and ITU-R Reports?

An "Overview of the ITU-R texts relating to the terrestrial component of IMT" can be found **here** and in the following, the most important documents are listed:

- ***Recommendation ITU-R M.1457-15*** - Detailed specifications of the terrestrial radio interfaces of International Mobile Telecommunications-2000 (IMT-2000) **(*October 2020*)**

  Recommendation ITU-R M.1579-2 - Global circulation of IMT-2000 terrestrial terminals **(January *2015*)**

- ***Recommendation ITU-R M.2012-6*** - Detailed specifications of the terrestrial radio interfaces of International Mobile Telecommunications Advanced (IMT-Advanced) **(*December 2023*)**

  Recommendation ITU-R M.2070-2 - Unwanted emission characteristics of base stations using the terrestrial radio interfaces of IMT-Advanced **(*December 2023*)**

  Recommendation ITU-R M.2071-2- Unwanted emission characteristics of mobile stations using the terrestrial radio interfaces of IMT-Advanced **(*December 2023*)**

  Recommendation ITU-R M.2083 - IMT Vision - "Framework and overall objectives of the future development of IMT for 2020 and beyond ***(September 2015)***

- ***Recommendation ITU-R M.2150-2*** **-** *Detailed specifications of the terrestrial radio interfaces of International Mobile Telecommunications-2020 (IMT-2020),* ***(December 2023)***

- ***Recommendation ITU-R M.2160*** **-** *Framework and overall objectives of the future development of IMT for 2030 and beyond (IMT-2030),* ***(November 2023)***

Note: The website "Overview of the ITU-R texts relating to the terrestrial component of IMT" provides a comprehensive list of IMT-relevant ITU-R Recommendations.

Complementing ITU-R Reports

Report ITU-R M.2334-0 - Passive and active antenna systems for base stations of IMT systems **(*November 2014*)**

Report ITU-R M.2375-0 - Architecture and topology of IMT networks **(*July 2015*)**

Report ITU-R M.2410-0 - Minimum requirements related to technical performance for IMT-2020 radio interface(s) **(*November 2017*)**

Report ITU-R M.2518 - Terrestrial International Mobile Telecommunications for remote sparsely populated areas providing high data rate coverage **(November 2022)**

Report ITU-R M.2520 - The use of the terrestrial component of International Mobile Telecommunications for the Cellular-Vehicle-to-Everything **(November 2022)**

Report ITU-R M.2528 - Capabilities of the terrestrial component of IMT-2020 for multimedia communications **(September 2023)**

Report ITU-R M.2541 - Technical feasibility of IMT in bands above 100 GHz **(*May 2024*)**

Note: The website "ITU-R Reports on IMT" provides a comprehensive list of IMT-relevant ITU-R Reports.

11. Question: Is there a satellite component to IMT?

As explained in Q.3, from the very beginning of the IMT-development, a satellite component was part of the ITU-R work. A series of ITU-R Recommendations (standards) for the satellite component to **IMT-2000** have been developed including integration of the terrestrial and satellite mobile communication systems, these are:

Recommendation ITU-R M.818-2 - Satellite operation within International Mobile Telecommunications-2000 (IMT-2000) **(June 2003)**

Recommendation ITU-R M.1167 - Framework for the satellite component of International Mobile Telecommunications-2000 (IMT-2000) **(October 1997)**

Recommendation ITU-R M.1182-1 - Integration of terrestrial and satellite mobile communication systems **(June 2003)**

Recommendation ITU-R M.1850-2 - Detailed specifications of the radio interfaces for the satellite component of International Mobile Telecommunications-2000 (IMT-2000) **(September 2014)**

Recommendation ITU-R M.2014-1 - Global circulation of IMT-2000 satellite terminals **(September 2015)**

Consequently, for the satellite component of **IMT-Advanced** an ITU-R Recommendation has been developed:

> **Recommendation ITU-R M.2047** - Detailed specifications of the satellite radio interfaces of International Mobile Telecommunications-Advanced (IMT-Advanced) **(December 2013)**

In addition, ITU-R has commenced the process of developing ITU-R Recommendations for the satellite component of the **IMT-2020** radio interface(s), by agreeing on the vision/framework:

> **Report ITU-R M.2514** - Vision, requirements and evaluation guidelines for the satellite radio interface(s) of IMT- 2020, **(September 2022)**

12. Question: Is IMT-2000, IMT-Advanced, IMT-2020 or IMT-2030 3G, 4G, 5G or 6G?

ITU does not have a definition for 3G, 4G, 5G or 6G and ITU cannot hold a position on whether or not a given technology is labelled with any of these terms for marketing purposes.

IMT-2000, in use for over two decades since 2000, has been widely deployed and is commonly referred to as "3G".

The term "4G" remains undefined, but it is being applied by some operators to the forerunners of **IMT-Advanced** technologies — LTE, HSPA+, WiMax and to other evolved 3G technologies, which provide a substantial level of improvement in performance and capabilities with respect to the initial third generation systems. Specifications for mobile broadband wireless technology – **IMT-Advanced** – were agreed by the ITU Radiocommunication Assembly in January 2012.

Similarly, the term "5G" remains undefined, but the service requirements and main system characteristics developed by various standardization organizations for 5G correspond to the key characteristics that ITU has specified for **IMT-2020**, as the next step in mobile broadband wireless communications.

Likewise, so far the term "6G" is not explicitly defined, but four years ago (around the year 2020), the market started thinking and talking about "6G", its differences to existing IMT-generations with the vision to create a seamless reality where the digital and physical worlds as we know them today have merged. So, for the moment, 6G is the name for the sixth generation of cellular networks, which are expected to deliver truly omnipresent wireless intelligence. For the development of Recommendation ITU-R M.2160, the market - via the ITU-R Membership - has contributed to the **IMT-2030 Framework**.

Note: On 23.04.2024, 3GPP approved the new 6G logo (see here).

13. Question: What was the step represented by IMT-Advanced in global mobile broadband?

Specifications for IMT-Advanced were approved by the ITU Radiocommunication Assembly in January 2012.

With the completion of an intensive programme developed by ITU's Radiocommunication Sector (ITU-R) to stimulate global development of the future IMT technologies and following a detailed evaluation against stringent technical and operational criteria, ITU has determined that "LTE-Advanced" and "WirelessMAN-Advanced" should be accorded the official designation of IMT-Advanced.

IMT-Advanced systems include new capabilities that go beyond IMT-2000, widely deployed since 2000 and referred to as 3G mobile technology. ITU has specified the standards for IMT-Advanced, a significant step in global wireless broadband communications.

IMT-Advanced provides comprehensive support for broadband wireless data and brings major improvements.

These include increased spectrum efficiency to handle more users at higher data rates per radio channel; a fully packet-based architecture for reduced costs; lower latency leading to more responsive Internet and multimedia applications; improved radio resource management and control to enhance quality of service, and new capabilities for the radio interface such as wideband radio channels and multiple-input and multiple-output (MIMO) for the use of multiple antennas at both the transmitter and receiver end to improve communication performance.

14. Question: What is the step represented by IMT-2020 in global mobile broadband?

The socio-technical evolution in the last few decades has been significantly driven by the evolution of mobile communications and has contributed to the economic and social development of both developed and developing countries. Mobile communication has become closely integrated in the daily life of the whole society and formed a foundation for society in 2020 and beyond.

The scope of IMT-2020 (5G) is much broader than the previous generations of mobile broadband communication systems and IMT-2020 is designed to provide more capacity for social media, video streaming and other things we are already doing today, but also for new innovative use cases such as securely streaming high-quality video from an ambulance to the hospital and enabling a range of new types of smart devices and industry digitalization. New demands, such as more traffic volume, many more devices with diverse service requirements, better quality of user experience (QoE) and better affordability by further reducing costs, required an increasing number of innovative solutions, which can be provided by the radio interfaces which have been implemented in the IMT-2020 specifications (Recommendation ITU-R M.2150).

While previous network generations were mostly designed for phones, IMT-2020 networks were designed for much more flexible use, replacing the need for many special-purpose networks. They can even function as many separate networks – all at the same time. **This IMT-2020 feature is called "network slicing"**. Slices of the network can be tailored for a specific purpose and act as its own independent network. Each slice can optimize the characteristics that are needed for a specific service without wasting resources on things it doesn't need. It's the smart 5G Core that makes slicing possible, which also guarantees the connection and performance that each slice was set up to deliver. It comprises not just an enhancement to the traditional mobile broadband scenarios, but extending the application of this technology to use cases involving ultra- reliable and low latency communications, and massive machine-type communications, as described in the IMT Vision included in Recommendation ITU-R M.2083.

15. Question: What is the international and national role in the standardization of IMT?

In terms of spectrum, the ITU Radio Regulations (RR) establishes the allocation of specific frequency bands for each radio service (41 services in total), including the mobile terrestrial service (the service involved, in this case).

At the national or regional level, such allocated bands are then further allocated or assigned for specific types of system or applications using specific channel arrangements. These channel arrangements may differ from region to region or from country to country, resulting in a large diversity of such "bands".

As the channelling arrangements do not necessarily use the whole allocated spectrum, and sometimes channelling plans might overlap each other, the sum of bandwidths of the various bands does not match with the total bandwidth of allocated spectrum.

While spectrum allocations are defined on RR, which has the power of international treaty, the various channeling options and their resulting "bands" are considered mainly by the ITU-R Study Groups, (in this case ITU-R Study Group 5), and the results are issued as ITU-R Recommendations.

Such Recommendations or standards are not compulsory, however as they are developed with the participation of all sectors of the industry and approved by ITU Member States, they play a key role in determining which channel arrangements are adopted in a given region or country. ITU strives to achieve worldwide harmonization of these channel arrangements, to the universal benefit of industry and users, but in some cases this goal is not able to be fully achieved.

There are specific ITU-R Recommendations which describe the detailed technical specifications for the IMT terrestrial radio interfaces, including IMT-2000, IMT-Advanced and IMT-2020; they specify which technologies fully meet the technical criteria for the respective IMT radio interfaces. See here - https://www.itu.int/rec/R-REC-M/en.

16. Question: What are the spectrum bands identified for IMT systems?

Successive World Radiocommunication Conferences (WRCs) have identified specific frequency bands for the deployment of IMT systems in general (which includes IMT-2000, IMT- Advanced and IMT-2020). This identification does not preclude the use of any of these bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. In effect, it is up to each country to determine whether and which bands will be made available for IMT in each country/region depending on national/regional requirements.

The Radio Regulations (RR) identify the following frequency bands that might be used by IMT systems:

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, RR edition 2024 and WRC-23 Final Acts

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

As decided at **World Radiocommunication Conference** in 2023 (WRC-23) part of the following bands will be studied with a view to an IMT identification (WRC-27, Agenda Item 1.7):

- 4 400-4 800 MHz, or parts thereof, in Region 1 and Region 3;
- 7 125-8 400 MHz, or parts thereof, in Region 2 and Region 3;
- 7 125-7 250 MHz and 7 750-8 400 MHz, or parts thereof, in Region 1;
- 14.8-15.35 GHz (globally).

The results of the studies will be submitted for decision to the next **World Radiocommunication Conference** (WRC-27).

17. Question: Where are the 'key technical performance parameters for IMT-2020 (5G)'?

Report ITU-R M.2410 - *"Minimum requirements related to technical performance for IMT-2020 radio interface(s)"* describes key requirements related to the minimum technical performance of IMT-2020 candidate radio interface technologies. It also provides the necessary background information about the individual requirements and the justification for the items and values chosen. Provision of such background information is needed for a broader understanding of the requirements:

- **Peak data rate:** Maximum achievable data rate under ideal conditions per user/device (in Gbit/s).
  ➔ Downlink peak data rate of 20 Gbit/s, Uplink peak data rate of 10 Gbit/s
- **User experienced data rate:** Achievable data rate that is available ubiquitously across the coverage area to a mobile user/device (in Mbit/s or Gbit/s).
  ➔ Downlink user experienced data rate of 100 Mbit/s, Uplink user experienced data rate of 50 Mbit/s
- **Latency:** The contribution by the radio network to the time from when the source sends a packet to when the destination receives it (in ms).
  ➔ 4 ms for eMBB and 1 ms for uRLLC
- **Mobility:** Maximum speed at which a defined QoS and seamless transfer between radio nodes which may belong to different layers and/or radio access technologies (multi-layer/-RAT) can be achieved (in km/h).
  ➔ Stationary: 0 km/h, Pedestrian: 0 km/h to 10 km/h, Vehicular: 10 km/h to 120 km/h, High speed vehicular: 120 km/h to 500 km/h

- **Connection density:** Total number of devices fulfilling a specific quality of service (QoS) per unit area (per km^2).
  ➔ 1 million devices per km^2

- **Spectrum efficiency:** Average data throughput per unit of spectrum resource and per cell (bit/s/Hz).
  ➔ Downlink peak spectral efficiency of 30 bit/s/Hz, Uplink peak spectral efficiency of 15 bit/s/Hz

- **Area traffic capacity:** Total traffic throughput served per geographic area (in $Mbit/s/m^2$).
  ➔ 10 $Mbit/s/m^2$ (in the Indoor Hotspot – eMBB test environment)

- Other parameters: **Energy efficiency, reliability, control plane latency, mobility interruption time,** etc. with their applicable scenarios are provided in **Report ITU-R M.2410.**

See also: ITU Press Release of 26 November 2020.

18. Question: Where can I find further information from ITU regarding IMT-2020 and IMT-2030?

ITU-R is regularly updating the *"IMT-2020"* webpage with information about the development of the mobile 5G technology e.g. the list of ITU-R Recommendations, Reports and Resolutions.

In the same way, the "IMT towards 2030 and beyond (IMT-2030)" website provides information about the progress in developing the specifications for the latest generation of IMT-technology.

For both activities ITU-R Working Party 5D is responsible - The webpage can be accessed here.

19. Question: What frequency bands are currently under study for the implementation of IMT?

As decided at **World Radiocommunication Conference** in 2023 (WRC-23) part of the following bands will be studied with a view to an IMT identification (WRC-27, Agenda Item 1.7):

- 4 400-4 800 MHz, or parts thereof, in Region 1 and Region 3;
- 7 125-8 400 MHz, or parts thereof, in Region 2 and Region 3;
- 7 125-7 250 MHz and 7 750-8 400 MHz, or parts thereof, in Region 1;
- 14.8-15.35 GHz (globally).

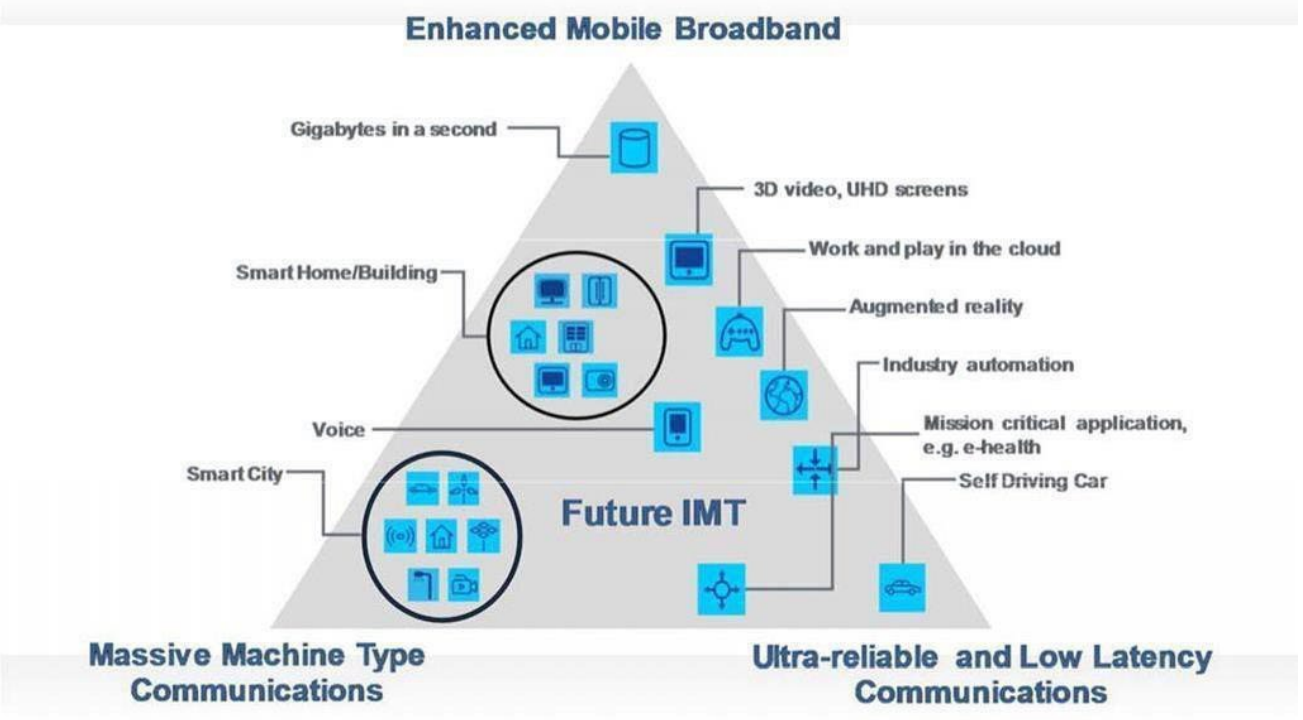
The results of the studies will be submitted for decision to the next WRC-27.

20. Question: What are some usage scenarios of IMT for 2020 and beyond?

Three main usage scenarios for IMT-2020 have been identified in **Recommendation ITU-R M.2083**, ***"IMT Vision – Framework and overall objectives of the future development of IMT for 2020 and beyond,"*** which are enhanced mobile broadband, ultra-reliable and low latency communications, and massive machine-type communications. Additional use cases are expected to emerge, which are currently not foreseen. For future IMT, flexibility will be necessary to adapt to new use cases that come with a widely varying range of requirements.

IMT-2020 will encompass a large number of different features. Depending on the circumstances and the different needs in different countries, future IMT systems should be designed in a highly modular manner so that not all features have to be implemented in all networks.

This following figure illustrates some examples of envisioned usage scenarios for IMT-2020.



21. Question: What is to be expected from IMT-2030 (6G)?

The Radiocommunication Assembly 2023 (RA-23) approved the revisions of Resolution ITU-R 56, confirming the name for the next generation of IMT (aka "6G") to be "IMT-2030" and Resolution ITU-R 65, which describes the principles of the IMT-process. Along these revisions, RA-23 also approved the new Recommendation on the "IMT-2030 Framework", which has become Recommendation ITU-R M. 2160.

Together with the already existing Report on "Future Technology Trends" ITU-R M.2516, this marks the achievement of the **initial phase, setting the basis for the development of IMT-2030. The next phase (2024-2027)** will be the definition of relevant requirements and evaluation criteria for potential radio interface technologies (RIT) for IMT-2030.

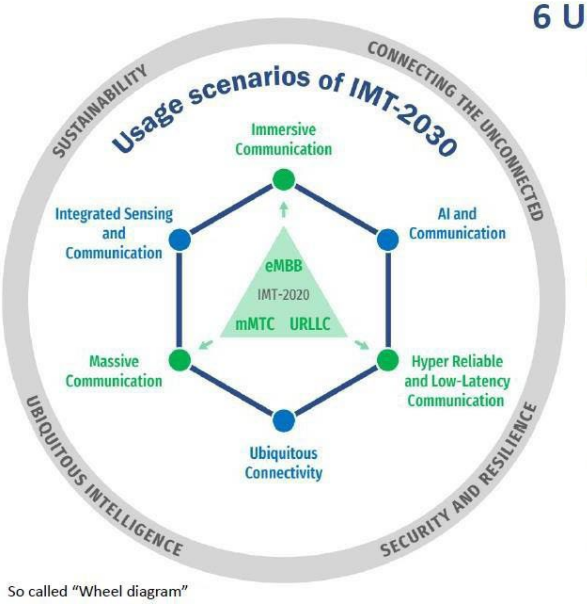
At its first meeting in 2024, ITU-R SG 5 approved a new Report ITU-R M.2541 about the "Technical feasibility of IMT in bands above 100 GHz", which includes information on propagation mechanisms and channel models, as well as newly developed technology enablers such as active and passive components, antenna techniques, deployment architectures, and the results of simulations and performance tests. As such, it complements Report ITU-R M.2376 containing studies for the frequency ranges 6-100 GHz.

As of July 2024, ITU completed the framework and is currently working on the requirements and evaluation criteria for IMT-2030.

The new Framework-Recommendation ITU-R M. 2160 addresses:

- Trends of IMT-2030
- Usage scenarios of IMT-2030
- Capabilities of IMT-2030
- Considerations of ongoing development

Usage scenarios



So called "Wheel diagram"

6 Usage scenarios

Extension from IMT-2020 (5G)

- eMBB ➡ Immersive Communication
- mMTC ➡ Massive Communication
- URLLC ➡ HRLLC (Hyper Reliable & Low-Latency Communication)

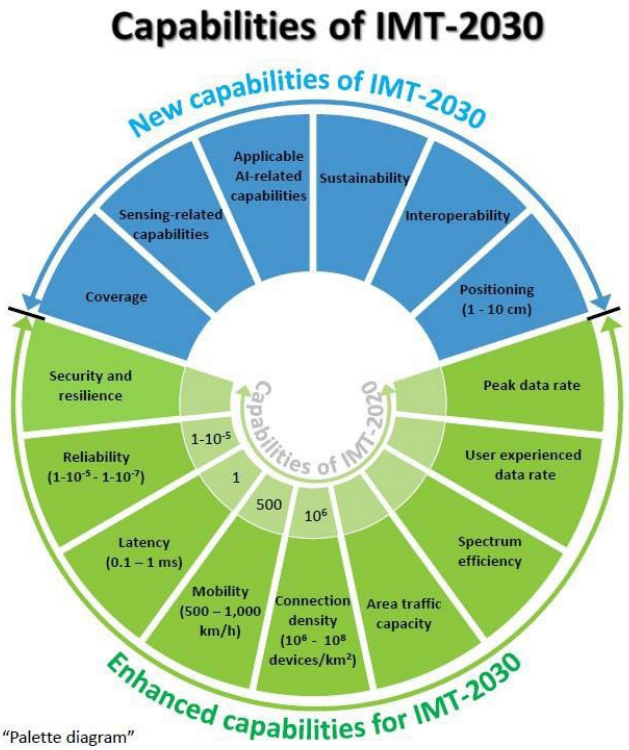
New

- 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



So called "Palette diagram"

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.

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22. Question: Where can I find more information about IMT?

A more comprehensive IMT-explanatory document "*Overview of the ITU-R texts relating to the terrestrial component of IMT*" was prepared and agreed by the WP 5D Membership in 02/2024 which reference can be found on the WP 5D website (see also here).

In addition, the "*Handbook on International Mobile Telecommunications (IMT)*" is available. Initially published in 2015, it was updated in 2022, but does not yet contain information on IMT-2030 (6G).