



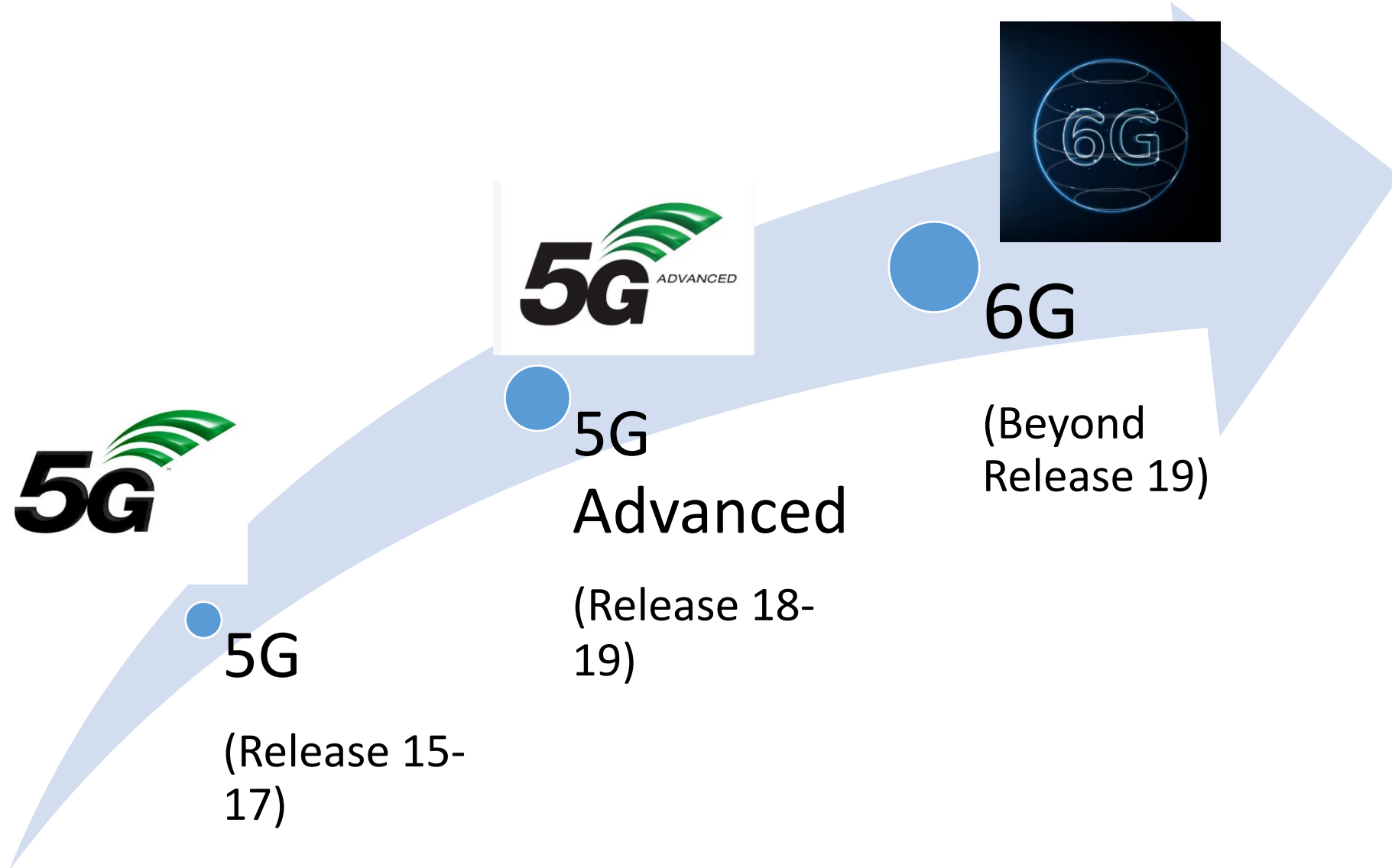
TELECOMMUNICATION ENGINEERING CENTRE
Department of Telecommunications
Ministry of Communications
Government of India



Bharat 6G Vision & IMT-2030: A brief overview



Present Status of IMT technology generations



Bharat 6G Vision

Tactile Internet

AI/ML on the air interface

Distributed Intelligence in the network

Tele-operated Autonomous Driving

Holographic Communication

AR/VR/XR

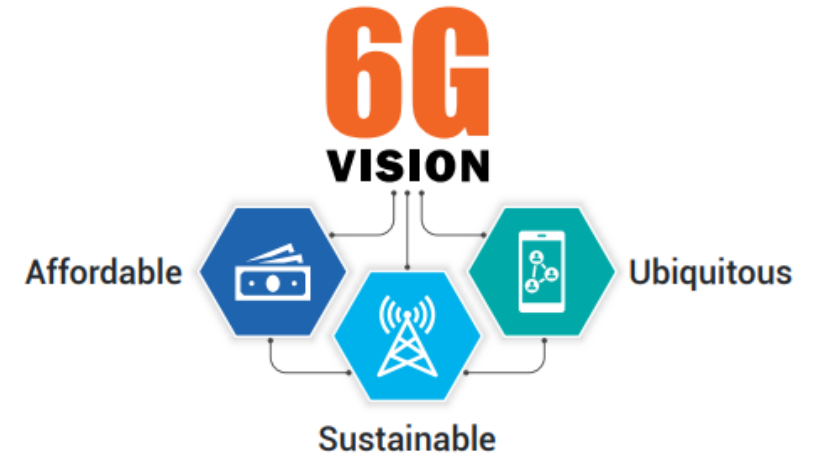
Next-Gen Industries

6G Devices (IoT & Biological Devices)

Hyper Connected Digital World

Security & Trust

Integrated Terrestrial & Non Terrestrial Ne



“

Design, develop and deploy 6G network technologies that provide ubiquitous intelligent and secure connectivity for high quality living experience for the world

”

Key Recommendations to Enable Bharat 6G Mission

Funding R&D

Innovative solutions through startups to address key verticals.

Multi-sensor man-machine interfaces and devices leveraging AI/ML, edge computing

Spectrum sharing, captive networks, reassessment of spectrum

mmWave and (Sub-) Terahertz (THz) wireless communications

Tactile Internet and Remote Operations of machines/ robots, along with near-realistic 3D rendering experience

Participation on global standardization forums

Application Trends for 6G (IMT-2030)



TRENDS

Ubiquitous Intelligence

Ubiquitous computing

Immersive multimedia and multi-sensory interactions

Digital twin and virtual world

Smart industrial applications

Digital health and well-being

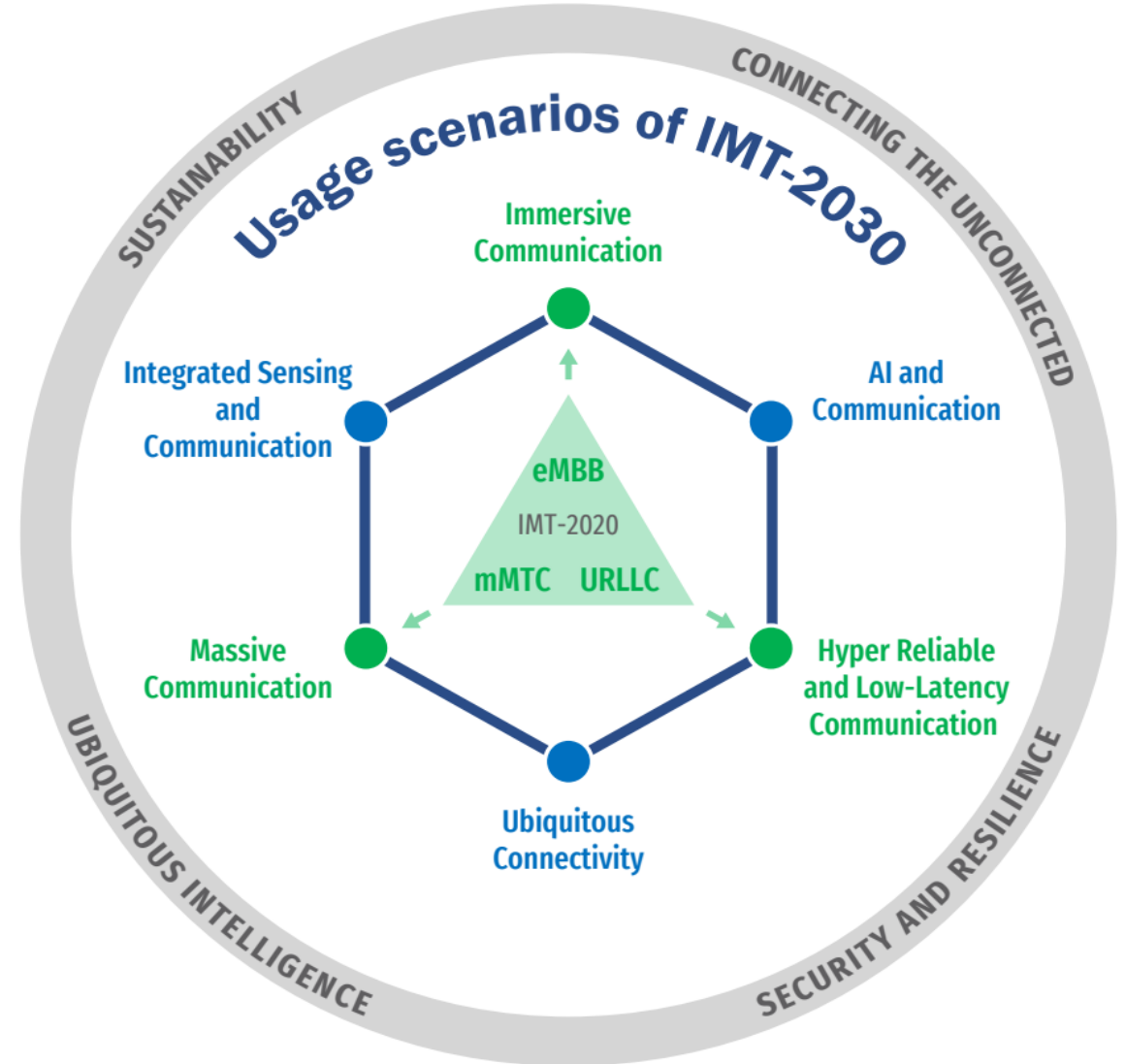
Ubiquitous connectivity

Integration of sensing and communication

Sustainability

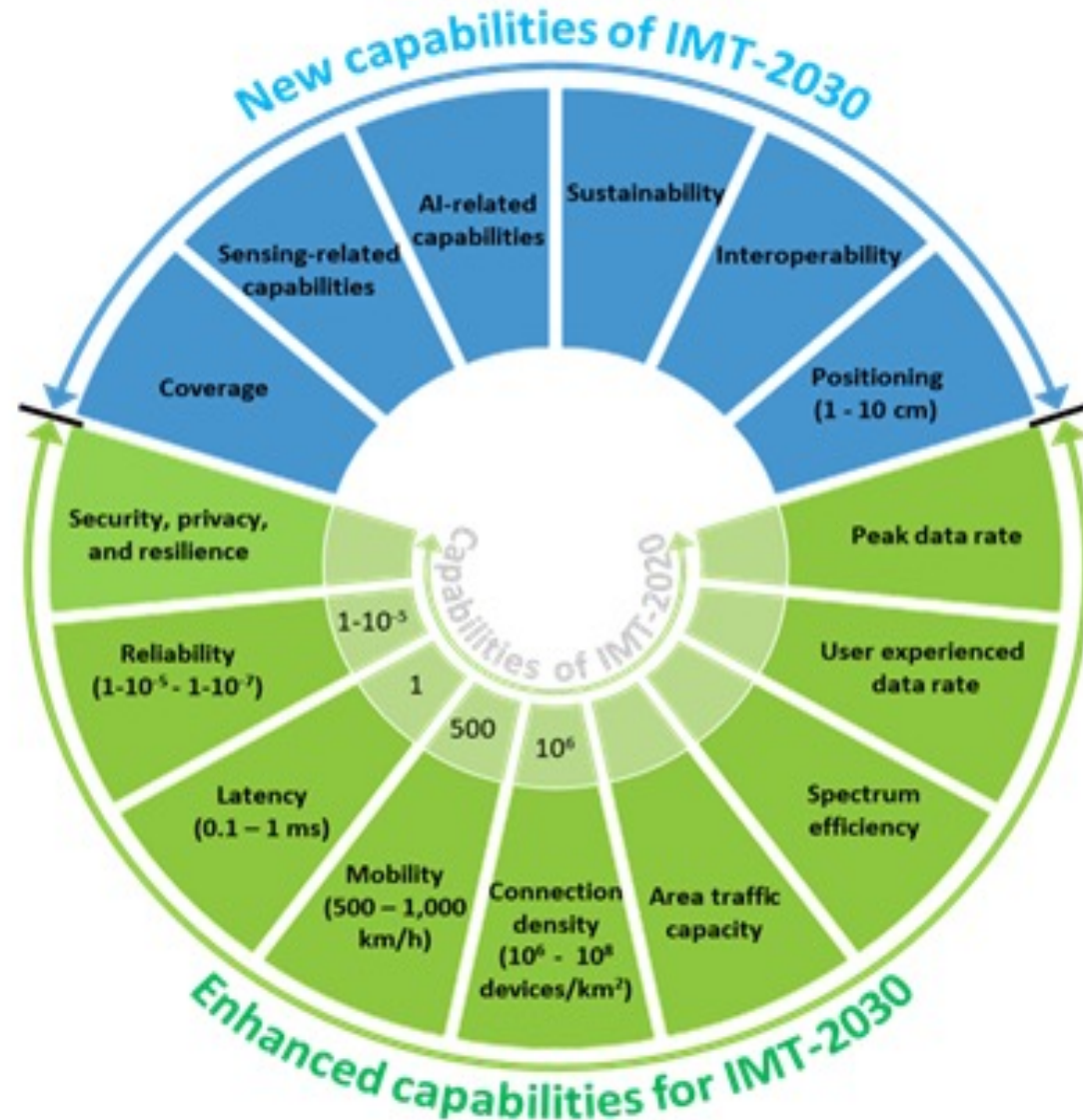
Usage Scenarios for 6G (IMT-2030)

- **Immersive Communication** (extends eMBB of IMT-2020)
- **Hyper Reliable and Low Latency Communication** (extends URLLC of IMT-2020)
- **Massive Communication** (extends mMTC of IMT-2020)
- **Ubiquitous connectivity** (intended to enhance connectivity with the aim to bridge the digital divide, through interworking with other systems)
- **Artificial Intelligence and Communication** (support distributed compute and AI-powered applications.)
- **Integrated Sensing and Communication** (use of IMT-2030 to offer wide area multi-dimensional sensing that provides spatial information about unconnected objects as well as connected devices and their movements and surroundings.)

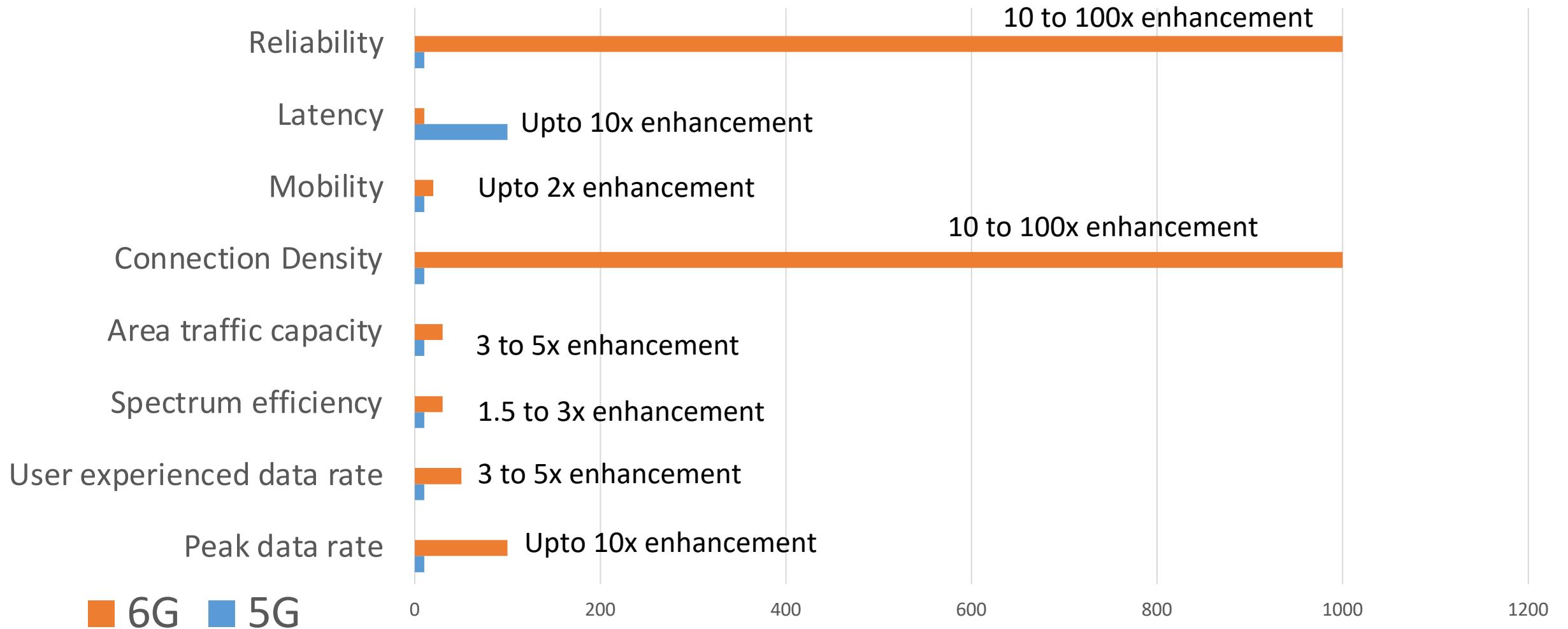


Capabilities of 6G (IMT-2030)

IMT-2030 is expected to provide **enhanced capabilities compared to those described for IMT-2020**, as well as new capabilities to support the **expanded usage scenarios** of IMT-2030.



Enhancements in Capabilities of 6G vis-à-vis 5G



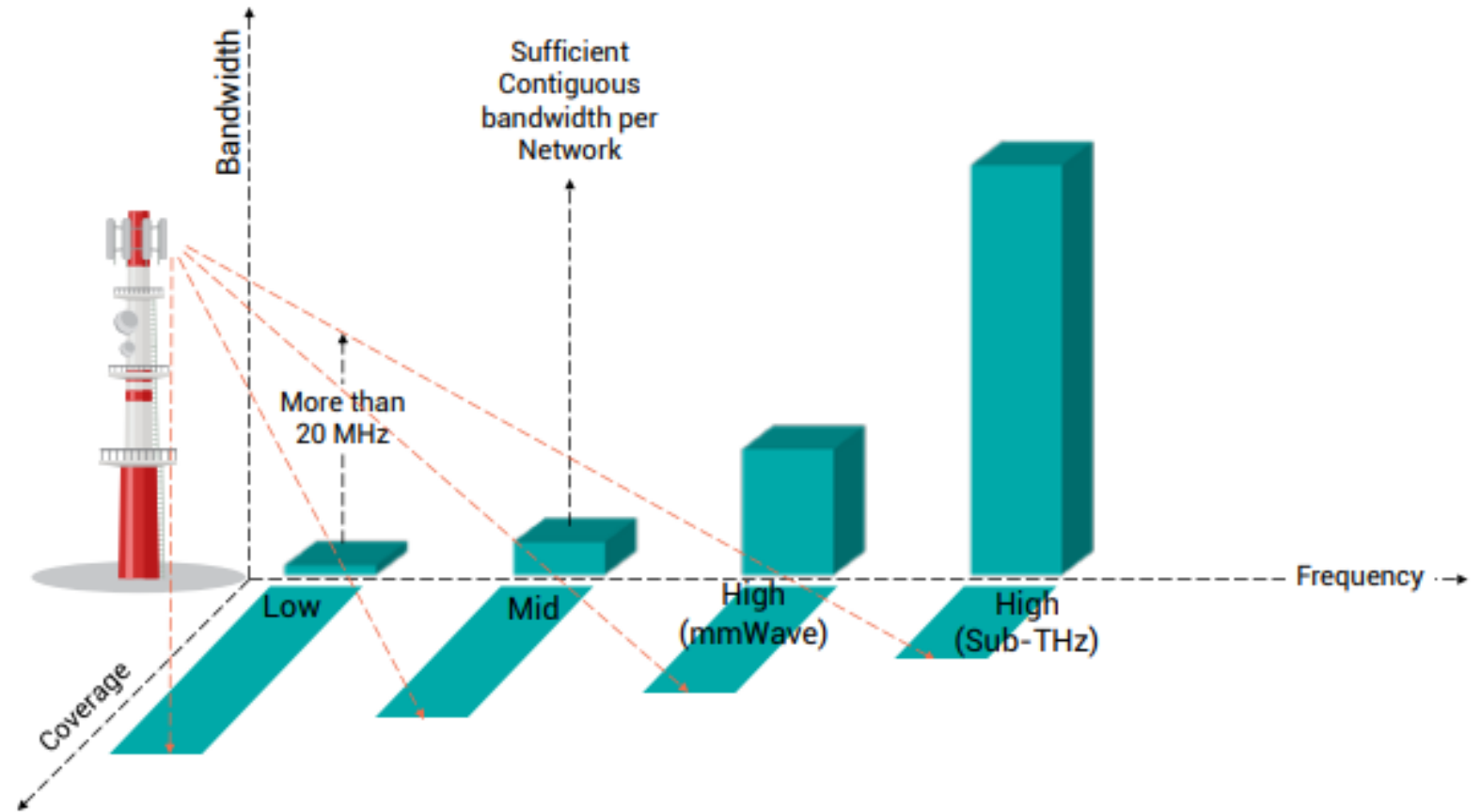
Spectrum Considerations in 6G

Need for Spectrum harmonization

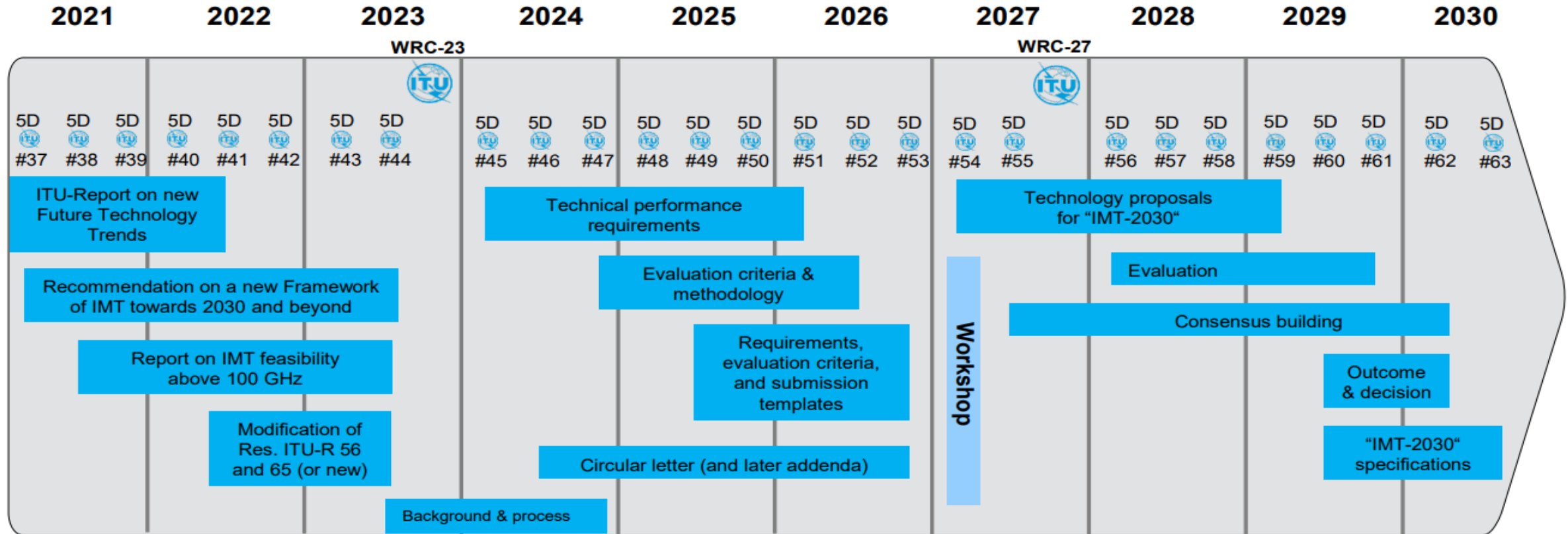
Importance of contiguous and wide spectrum bandwidth

Technical feasibility of IMT in bands above 100 GHz

Three Dimensions of 6G Spectrum



ITU-R timeline for IMT-2030



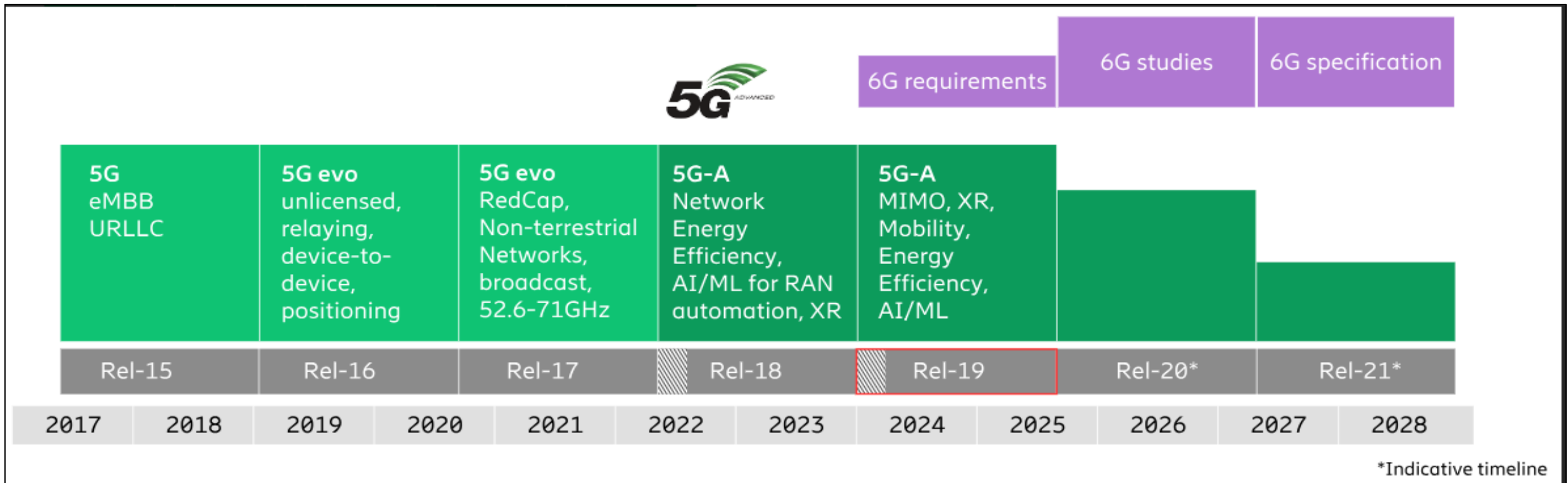
Note 1: WP 5D #59 will additionally organize a workshop involving the Proponents and registered Independent Evaluation Groups (IEGs) to support the evaluation process

Note 2: While not expected to change, details may be adjusted if warranted. Content of deliverables to be defined by responsible WP 5D groups

Note by the ITU-R Radiocommunication Bureaux: This document is taken from Attachment 2.12 to Chapter 2 of Document 5D/1361 (Meeting report WP 5D #41, June 2022) and adjustments could be made in the future. ITU holds copyright in the information – when used, reference to the source shall be done.

Tentative 3GPP timeline for IMT-2030 (6G) Release

- Currently 3GPP is in its Release 19, scheduled to be completed by 2025



Reference: Ericsson White Paper on 5G Advanced: Evolution towards 6G <https://www.ericsson.com/en/reports-and-papers/white-papers/5g-advanced-evolution-towards-6g#:~:text=Figure%201%20provides%20Ericsson's%20view,2028%2C%20followed%20by%206G%20evolution>

Thanks