Status of 5G deployment in India and the world, and India's role in The Road to 6G

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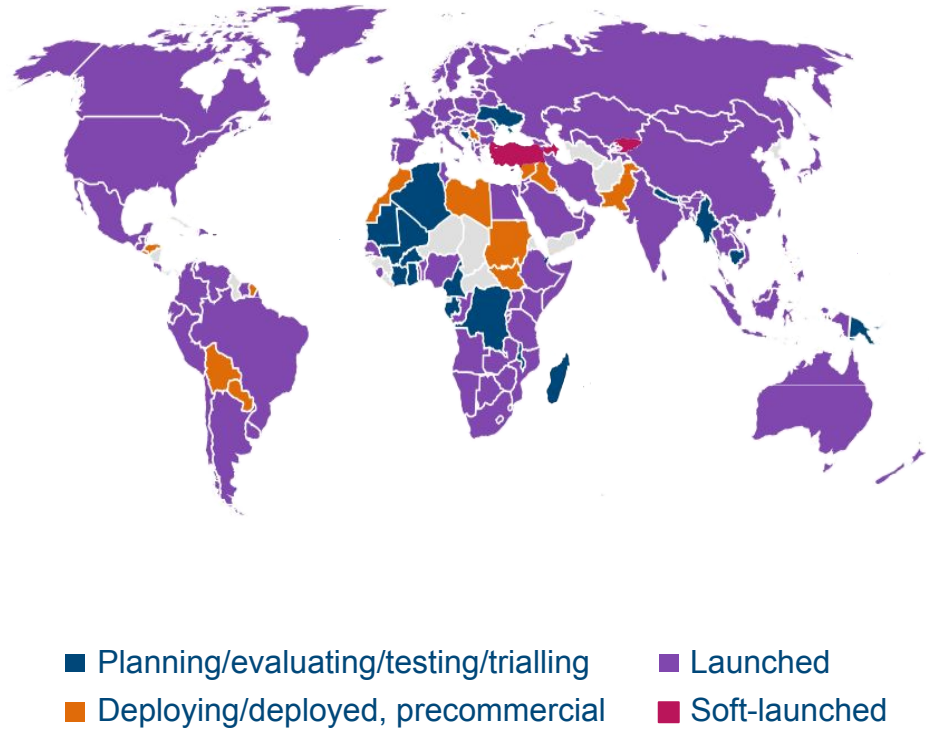
Vice Chairman - World Wireless Research Forum
Chairman, ITU WP5D General Aspects Working Group
Chairman, APT Task Group on RLAN

5G Rollout is continuing around the World

India saw the fastest 5G Rollout in the World

- ✔ 647 operators in 191 countries and territories are investing in 5G.
- ✔ 384 operators have launched one or more 3GPP-compliant 5G services. Of these, 358 operators have launched 5G mobile services.

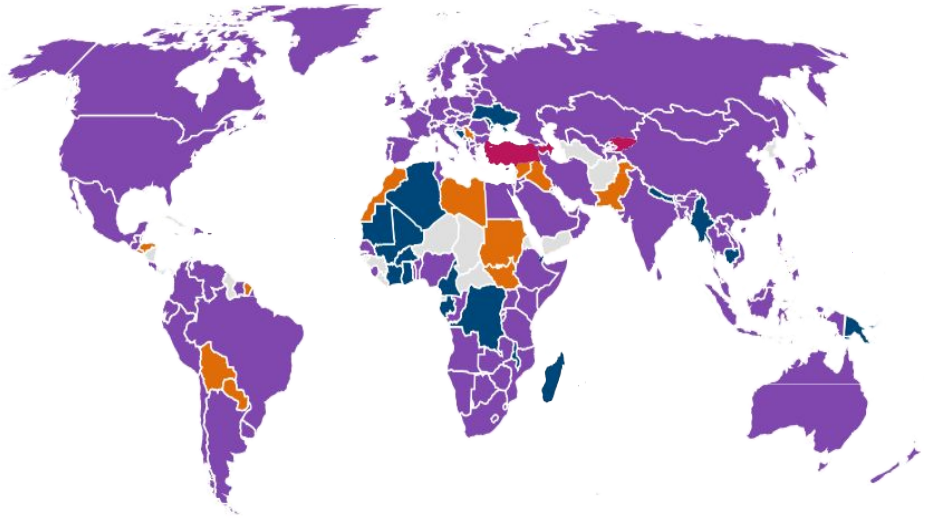


Source : GSA

IAFI
ITU-APT Foundation of India

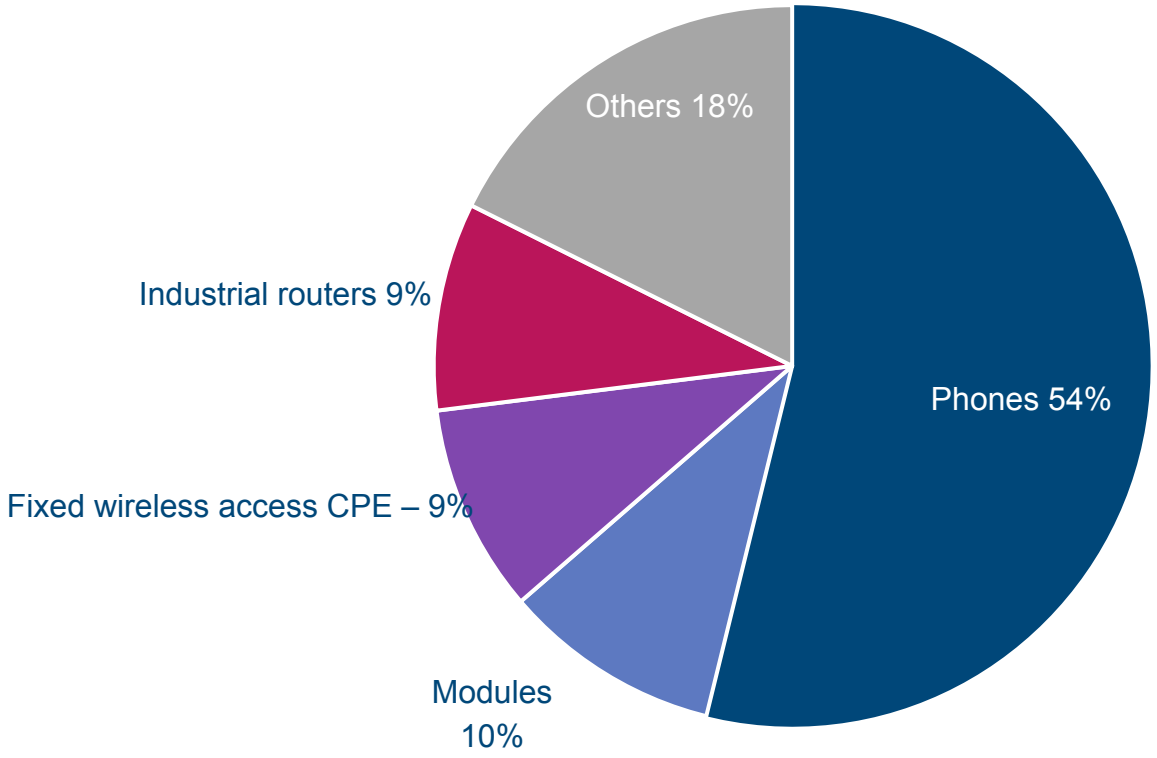
India saw the fastest 5G Rollout in the World

- ✔ Launched in October 2022
- ✔ Available in 99.9% districts
- ✔ 5,14,742 5G Base Stations out of a total of 3.1 million base stations
- ✔ Thousands of new 5G BTS being inaugurated every month



Mobile phones make up more than half of all 5G devices – over 3000 devices

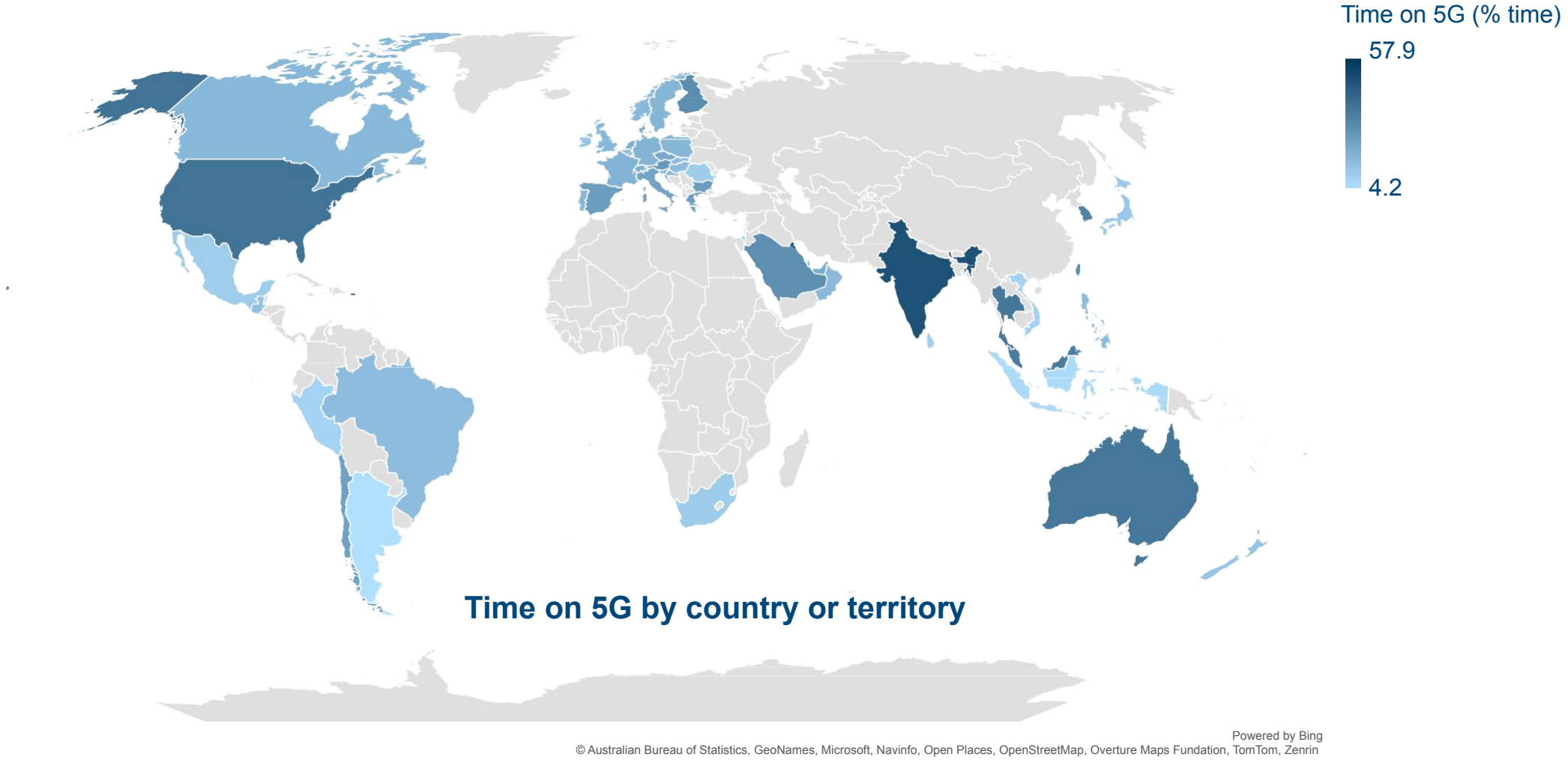
Share of commercially announced 5G devices by type



18%
year-on-year growth in commercially announced 5G devices

Source : GSA

People spend up to 57% time on 5G Networks
India Leads the world

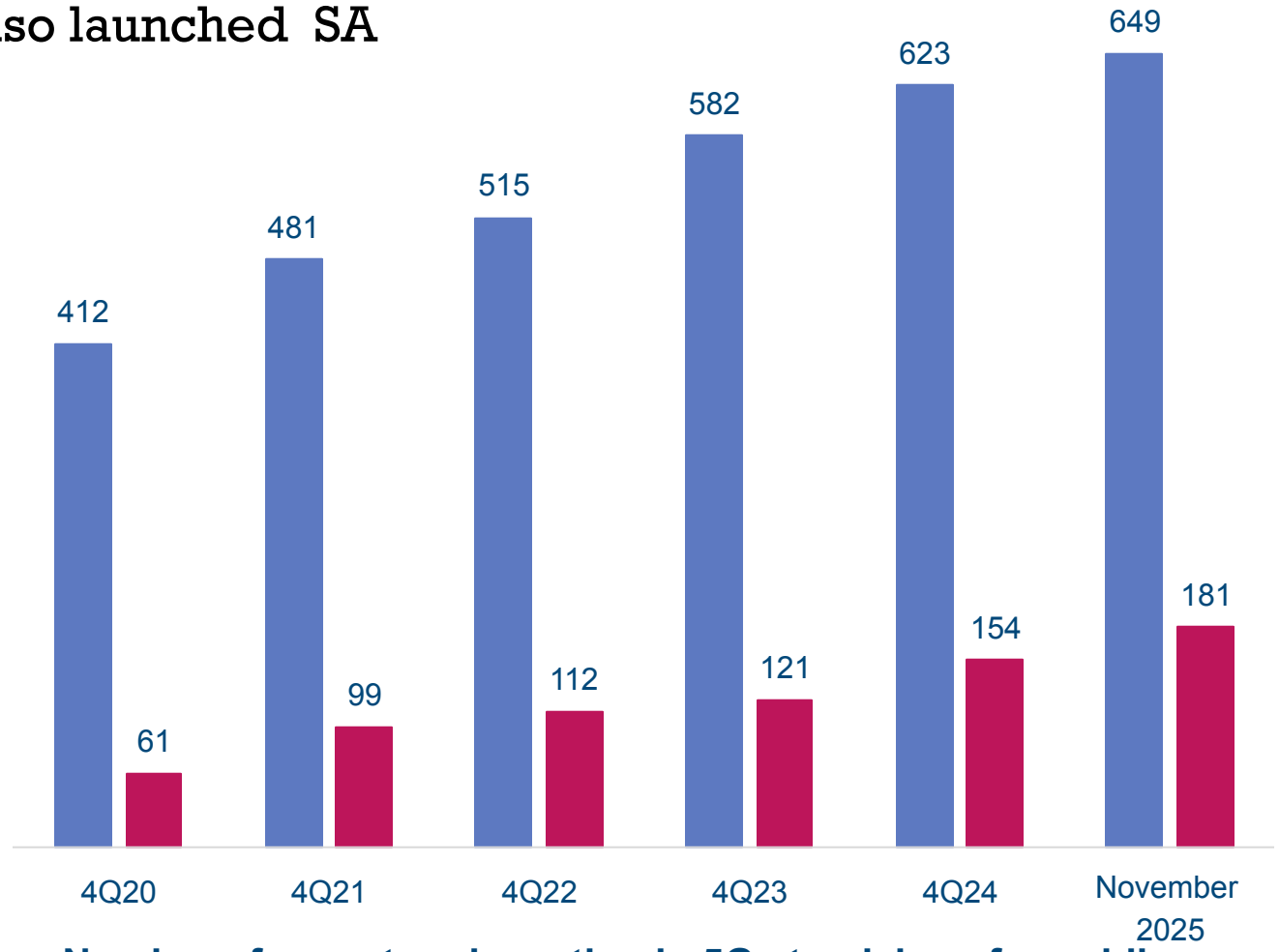


Source : GSA

Operators investing in 5G Standalone is increasing studly

India Operators have also launched SA

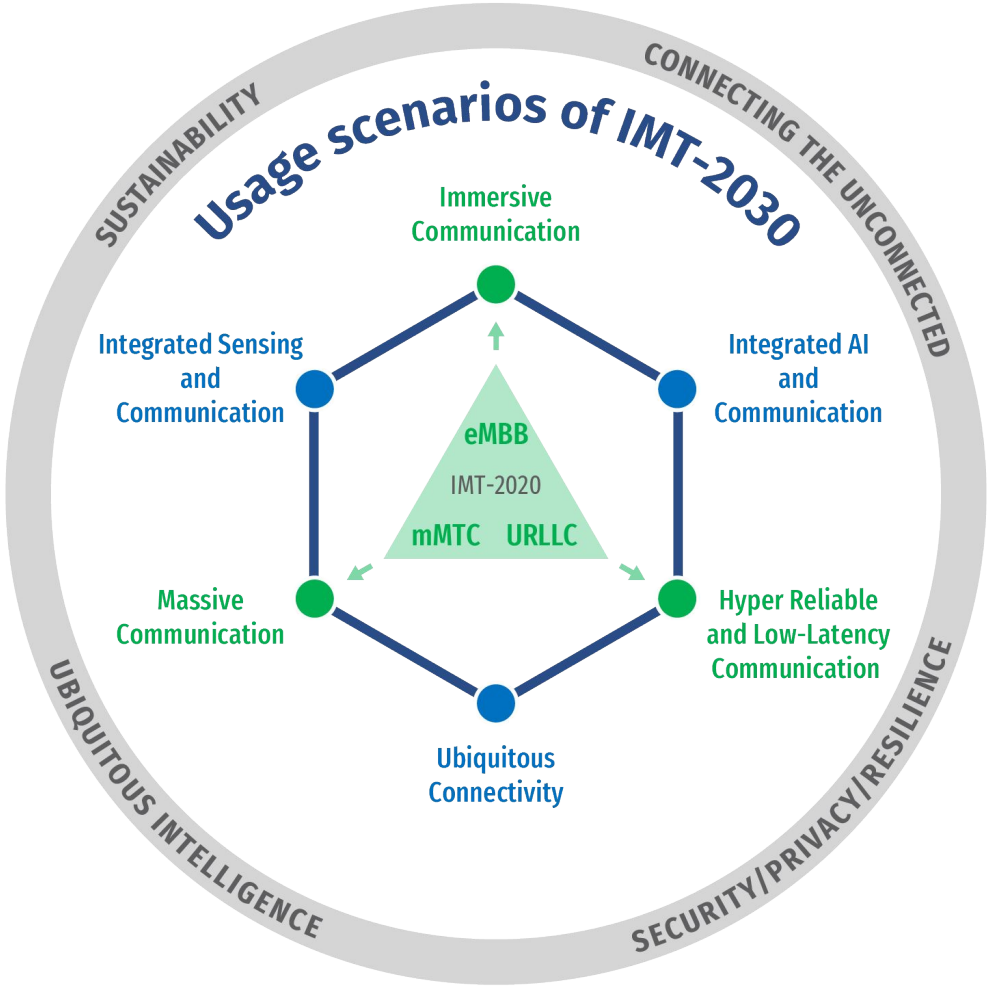
- 181 operators in 73 countries and territories worldwide that are investing in public 5G standalone networks.
- At least 85 operators in 47 countries and territories are understood to have launched public 5G standalone networks



Number of operators investing in 5G standalone for public networks versus number investing in 5GNSA or 4G

Source : GSA

ITU Finalized the 6G Framework Recommendation in 2023



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

ITU developed 6G - IMT-2030 -'Framework' Recommendation. It took 2 years to develop from 2021 to 2023. **This "Framework" is now the global dominant and de-facto standard 6G reference point**

6G Usage Scenarios - 6 groups

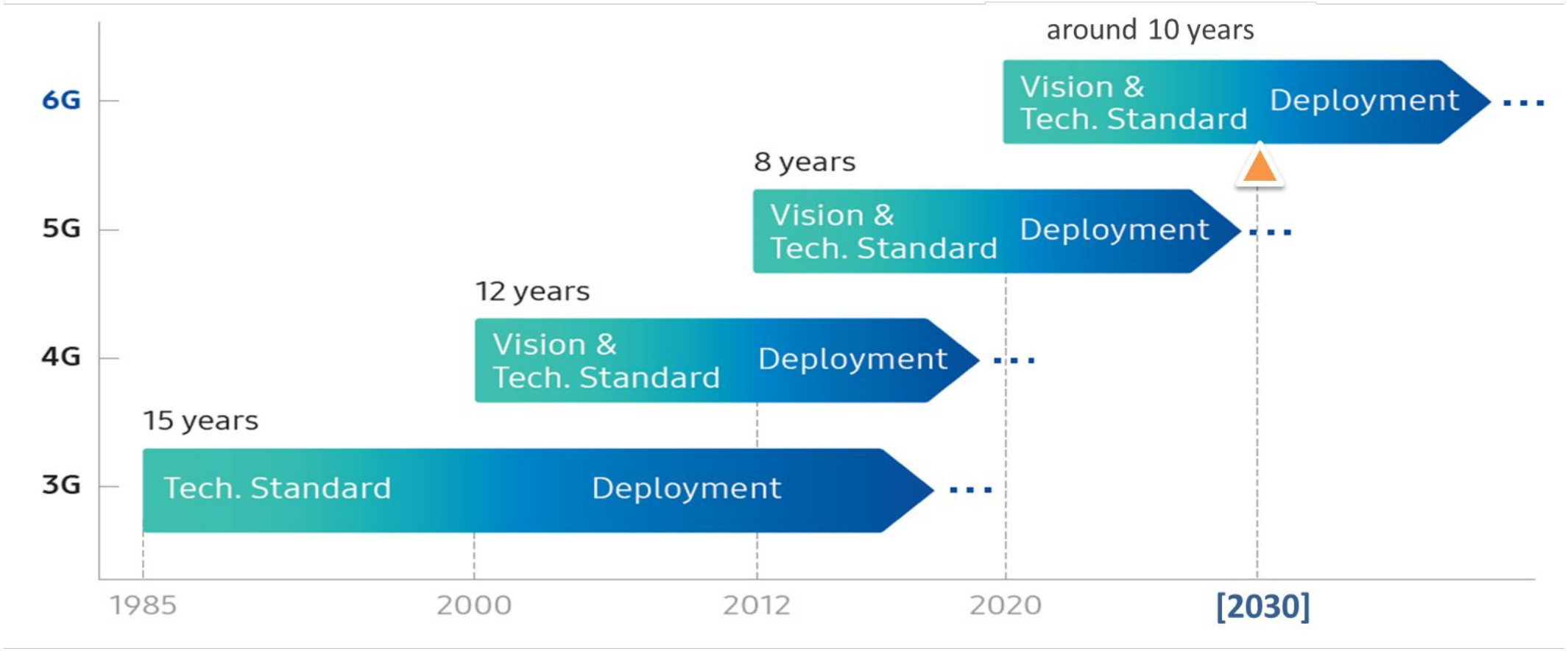
3 evolving from IMT-2020 (5G)

- eMBB→ **Immersive** Comms
- mMTC→ **Massive** Comms
- URLLC → **HRLLC** (Hyper Reliable & Low-Latency Comms

3 New for IMT-2030 (6G)

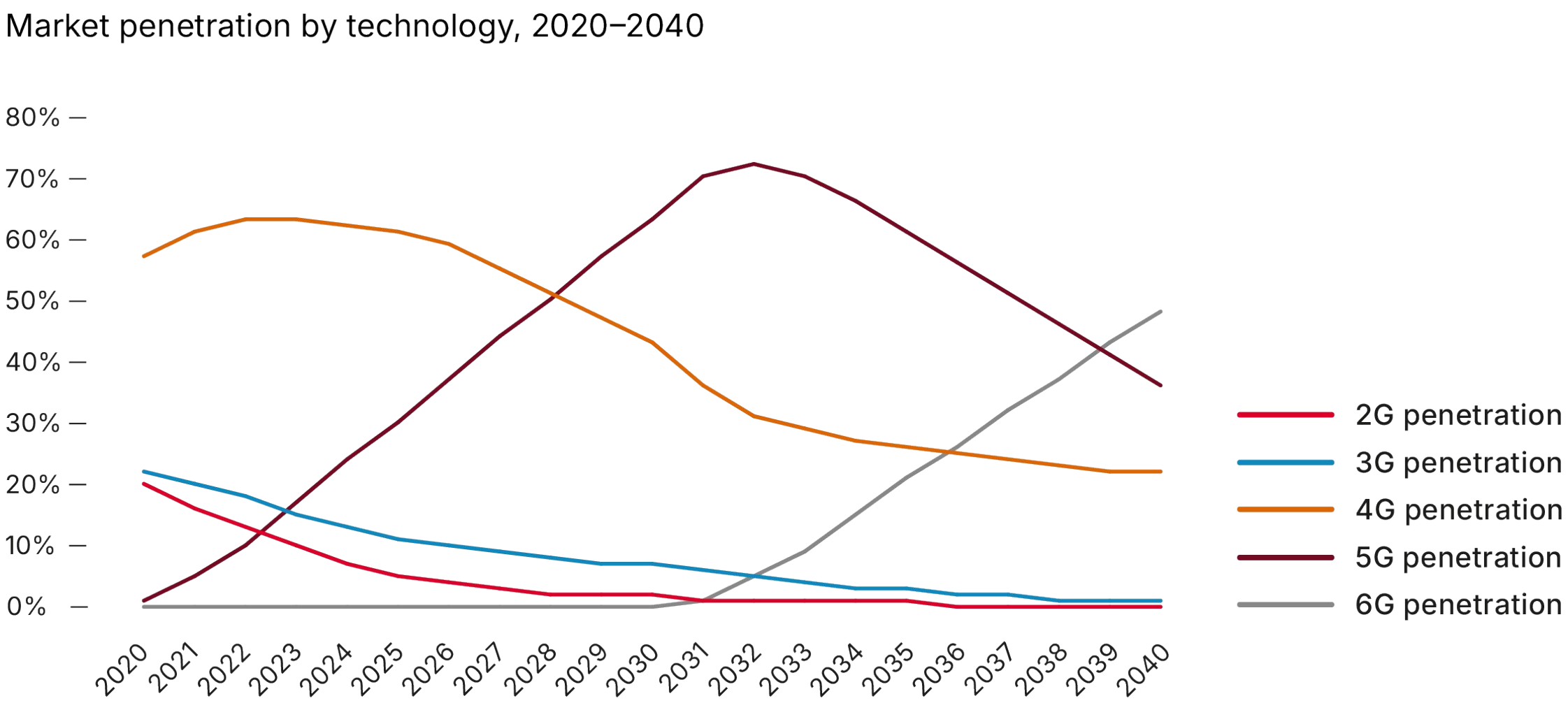
- **Integrated** AI & Comms
- **Ubiquitous** Connectivity
- **Integrated** Sensing & Comms

6G: "3GPP-2030" vision and standards timeframe



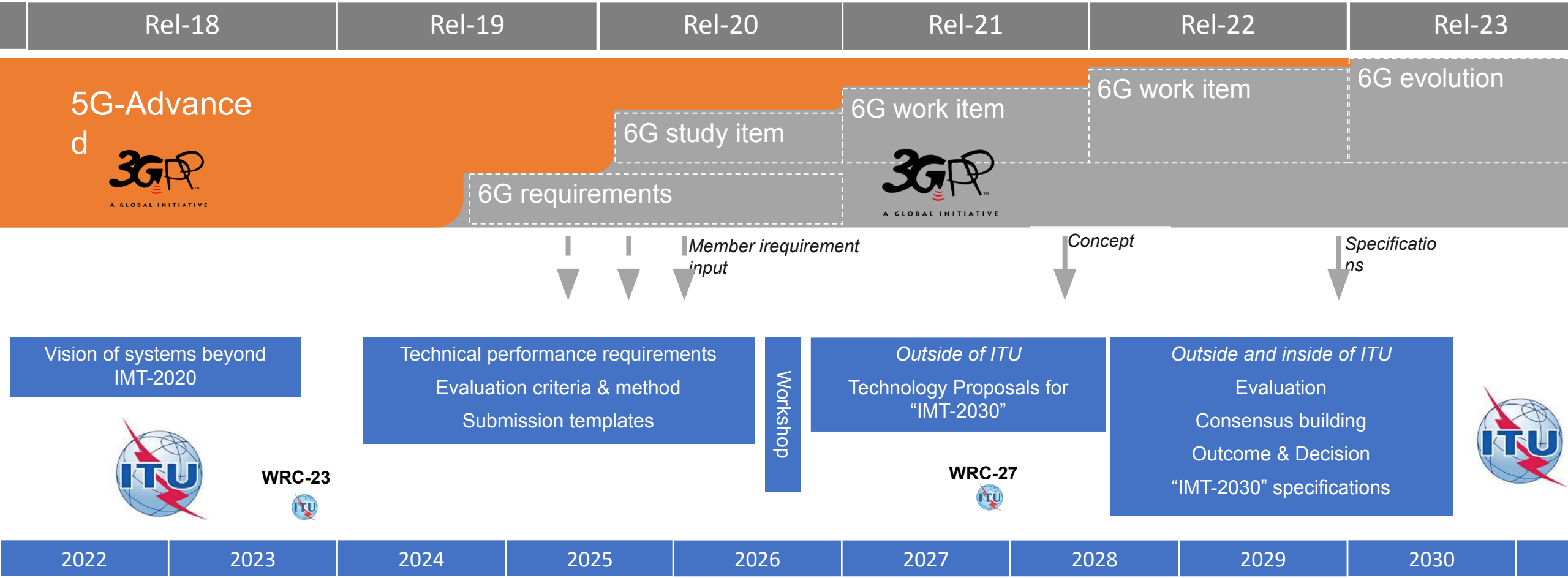
6G is expected to be deployed in 2030-2040

India plans to launch 6G by 2029

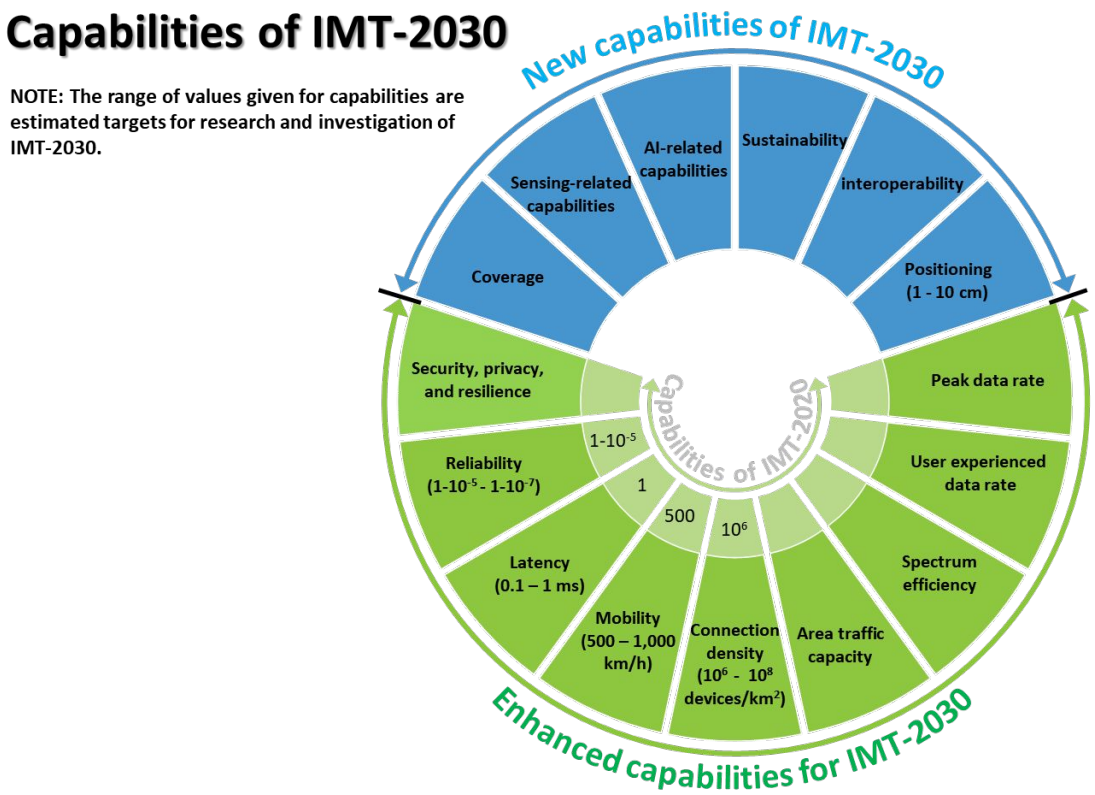


6G Development and Standardisation

Proposed ITU-R and 3GPP Timelines



IMT-2030 (6G) capability targets (TPRs) are currently being discussed within ITU-R WP5D



Examples by capabilities include:

- Peak data speeds of 50, 100, 200Gbps
- User data rates of 300Mbps, 500Mbps
- Spectrum efficiency x1.5, x3, of IMT-2020
- Traffic capacity of 30Mbps/m^2, 50Mbps/m^2
- Latency 0.1 to 1ms
- Positioning accuracy of 1cm to 10cm

Likely 6G Applications

1.

Tangibles

- MBB (Inc. Growing Video)
- FWA
- Enterprise digitalisation
- Some XR
- … AI

2.

Probables

- More XR
- More enterprise digitalisation – sensing, robotics, digital twins etc.
- Sensing
- …AI

3.

Disruptors

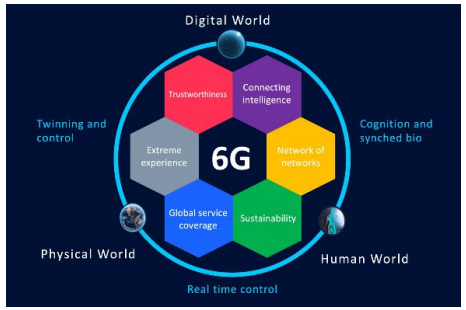
- Mass market, immersive XR
- Social holograms
- Holographic comms
- Massive sensing applications
- Widespread UAVs
- …AI

Global 6G research and framework

China

www.caict.ac.cn

Europe



www.hexa-x.eu

Japan

www.b5g.jp/en

India

www.bharat6galliance.com

Korea

Ministry of Science and ICT

www.msit.go.kr

ITU

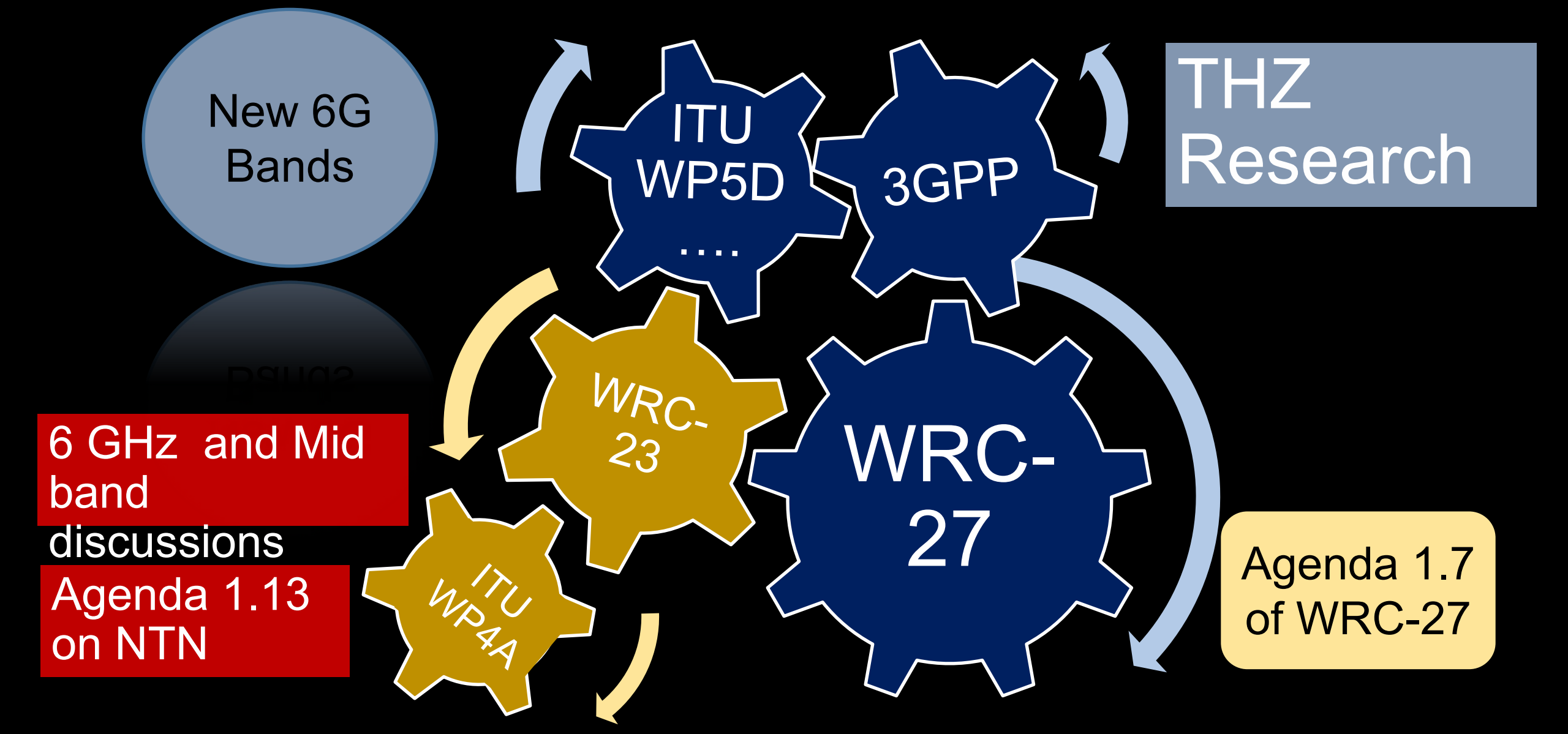
www.itu.int

USA

www.nextgalliance.org

6G Spectrum discussions have started

Focus on Agenda 1.7 of WRC-27



THANK YOU

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