



India Roadmap to 6G – B6GA Perspective

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Unlocking the Full Potential of 6 GHz Wi-Fi in
India*

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**Bharat 6G
Alliance**
Accelerating India's
6G Leadership



Bharat 6G Vision ...

- **India 6G roadmap** - Hon. Prime Minister of India (March 22, 2023)
- Design, develop and deploy 6G Network Technologies
- **Affordability, Sustainability, and Ubiquitous Coverage**
- Position India as a global leader in 6G
 - Contribution to global standardization

<https://dot.gov.in/circulars/bharat-6g-vision-statement>



- Incorporation of minimum Uplink Distance (Single Cell, Large Coverage)



Bharat 6G Alliance (B6GA)



- Formed in July 3, 2023
- India to become ...
 - A global supplier of IP, products and solutions in 6G
 - Affordable 5G and 6G
- Deploy 6G technologies by 2030
- Support and energize Indian participation in SDOs

Founding members (16)

- 3 Operators, 2 Academia, 3 Government R&D Labs, 8 Tech companies
- **Seven Working Groups**
- **Membership**
 - Corporate, Affiliate, Associate, Expert Members, and Guest Members
- MoU with International partners – 11
- 85 Members and growing

■ Seven Working Groups

1. Spectrum
2. Device technology, sensors and manufacturing ecosystem
3. Technology
4. Applications
5. Green and sustainability
6. Outreach
7. 6G use-cases and revenue stream



The 6G Context ...

Bharat 6G Vision (March 2023)

- Key Metrics for Bharat 6G: Affordability, Sustainability, and Ubiquitous Coverage
- Position India as a global leader in 6G
 - Contribution to global standardization
 - Strong 6G ecosystem (R&D, products, field trials, deployments)
 - 6G related IPR
 - Capacity building of workforce skilled in 5G and 6G

Key Lessons from 4G → 5G Migration

- Slow rate of adoption of 5G (globally)
- India – fastest rollout of 5G, # 5G Base stations installed ~ 5,30,000
- Fixed Wireless Access – monetization of 5G
- Strong growth in Wi-Fi
- Need for In-Building Solutions (IBS)

ITU and 3GPP

- 2026-2027 – Key standardization activities towards IMT 2030, 3GPP Rel. 21
- An important window of opportunity for India
- Need for multiple focused initiatives within India aligned towards 6G



Role of B6GA



- Contribute to development of **India 6G Roadmap**
 - Identified a three phases approach
- Identification of key technology areas for 6G ecosystem
 - Contribution to Standardization and Patents
- **Framing Call for 6G Proposals - R&D, Pre-6G, 6G Standardization, Product Development ...**
 - Scope of ongoing projects, and projects approved for funding
 - Requirements for standardization (3GPP, ITU) and development of 6G Testbed
 - Gap analysis and Recommendations
 - Pre-6G initiatives
- **Inputs on 6G Initiatives of GOI – DoT, MeitY, DST, ...**
- **Input on key DoT initiatives – Call for Proposal**
 - 6G Ecosystem projects – Components, modules ...
 - 6G Technology projects – Pre-6G Standards Testbeds
 - Standardization
- **Inputs on Spectrum and Policy aspects**
- B6GA WGs: Technology, Devices, Use Cases, Applications, Sustainability
- International coordination with MoU Partners



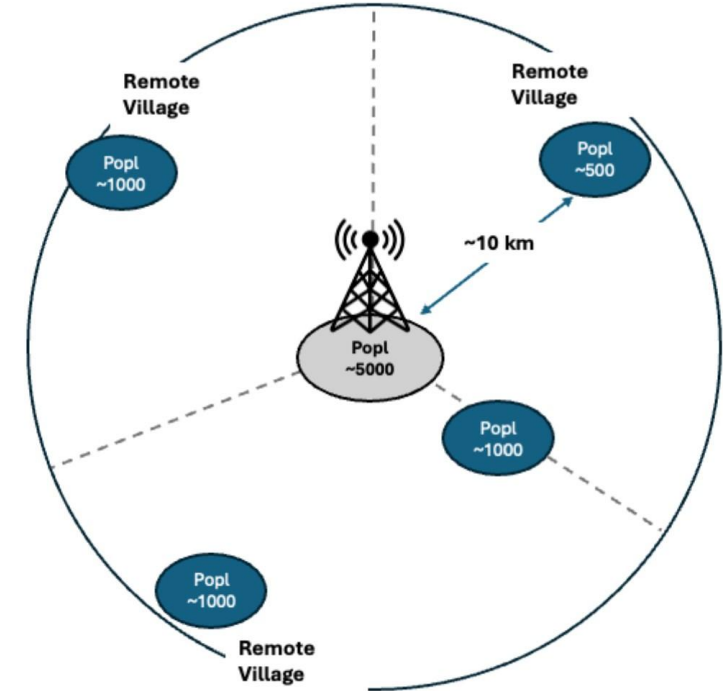
India 6G Roadmap Targets

- Strong participation in standards – 3GPP, ITU
- Targeting 10% share of global 6G patents
- Securing spectrum in high-priority bands (WRC-27, WRC-31)
 - 600 MHz, 6–8.4 GHz, and 14.8–15.35 GHz, mmWave and THz bands
- Ubiquitous Coverage
 - LMLC, SCLC
 - Cellular + Wi-Fi integration
 - Terrestrial and Non-Terrestrial Networks
- Setting up multi-institutional testbeds in consortium modes
 - Academia, startups and industry
 - Opportunities for R&D, Innovations, Technology Development, Prototypes
- Develop strong 6G ecosystem
- Design and execution of sector-specific use cases/pilots
 - Smart cities, Digital Twin, healthcare, agriculture, education, and public safety

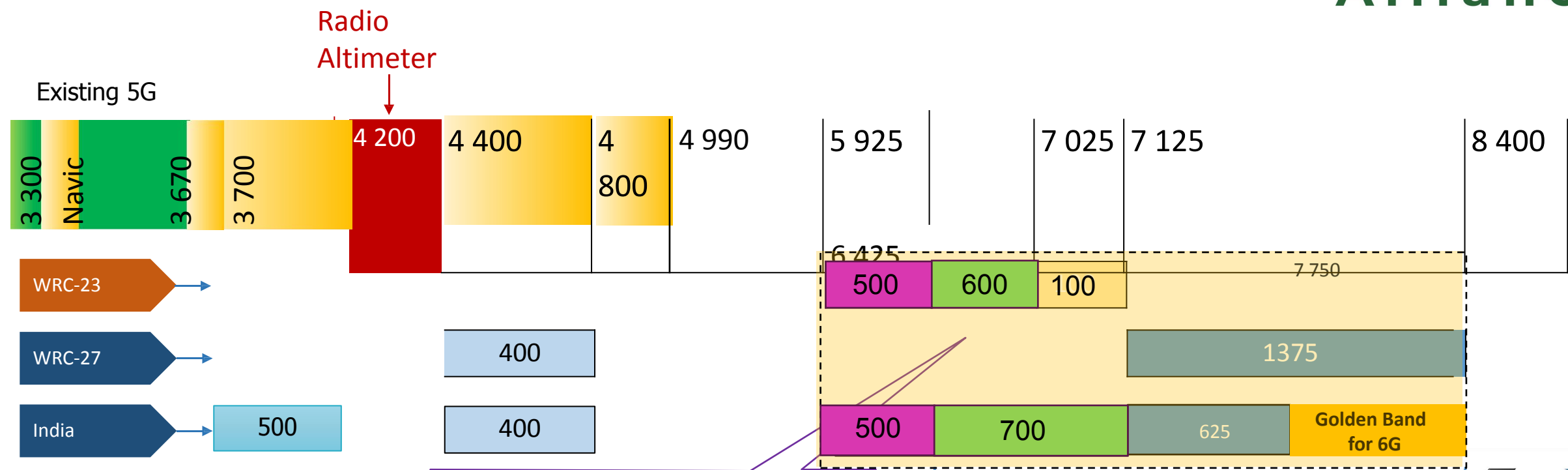


Success @ ITU & 3GPP

- IMT 2030 specification – minimum Technical Performance Requirements – mTPR
- Ubiquitous Coverage – part of Bharat 6G Vision
- Requirement of large cells (rural scenarios)
 - Uplink coverage is critical issue in 5G
 - Coverage KPI – Maximum Link Distance (MLD)
- India voice at ITU – Tejas, CEWiT, IITM, IITK, HFCL, IITH
 - Strong support by DoT
- SCLC is Single Cell with Large Coverage (non-contiguous cells)
- SCLC now added into 3GPP Standard 38.914
 - New deployment scenario
- In addition to Low Mobility Large Cell (LMLC) for Rural (contiguous cells)
- India's voice in global standards – an important milestone
 - 260 + T-DoCs in 3GPP and 14 technical docs in ITU-R
- Ability to overcome strong opposition from major players



India Spectrum Situation



- 6 GHz Band
- (300 + 300 + 100) = 700 MHz identified for IMT services
 - 400 MHz spectrum available currently
- 500 MHz Spectrum under consideration for unlicensed operation
- Sub 1 GHz band to complement 6G for coverage



Accelerating India's 6G Leadership

Bharat 6G VISION

Taskforce Report 6G Spectrum

Version 1.0

www.bharat6galliance.com

Summary

- 6G Roadmap: Phase 1 period 2026-2027
- MeitY 6G Research and Standardization Project commenced
- Funding opportunities under consideration
 - ANRF, DoT-TTDF
- **India-centric ubiquitous coverage requirement**
 - SCLC, IBS, NTN
- Key 6G Technology areas identified
- Pre-Standards Testbeds are crucial
- Ramping up 6G-related activities

Thank You ...

