



Bharat

6G VISION



सत्यमेव जयते
Government of India
Ministry of Communications
Department of Telecommunications
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The Path to 6G: India Perspective

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Current State of Telecommunications in India

- Reliable voice and high-speed data services across India
- Vast telecom network with 840,970 mobile towers with 3.13 Million plus Base Stations.
- Over 1.2 billion mobile subscribers, reaching a wireless tele-density of 83.12%, internet access including households is at 86.4%.
- Broadband Subscription > 990 Million
- > 27.5 GB per subscriber per month growing at the rate of 19.5% CAGR over 5 years → exceed network capacity in next 2-3 years
- 5G Adv requires 100 MHz additional midband spectrum
- Realization of Bharat 6G Vision ⇒ New spectrum (300+ MHz) in 7-15 GHz range
- India is “Mobile First Country” ⇒ with 96% using mobile to access Internet
- Connectivity backbone for the country’s digital services and applications like UPI, Aadhaar, ...

Lessons Learnt from 5G

- Challenges in Migration (4G → 5G + 4G Core → 5G + 5G Core)
 - Transition to 5G Standalone (SA) 5G + 5G Core was complex
- Deployment Inefficiencies
 - Excessive number of technical options ⇒ UE capabilities
- Slow Adoption of Key 5G features and Core Network Capabilities
- Slow return on Investment (RoI)
- Coverage challenges in 24.25 GHz and above
- Fixed Wireless Access (FWA)
 - Adoption (using 5G), Monetization (speed-based tariff plans)

6G should focus on

- Ubiquitous Coverage
 - FWA and Non-Terrestrial Networks (NTN) – Satellites and HAPS
- Support for New Services and Use Cases
 - Integrated Sensing and Communication (ISAC), XR/VR immersive communication
- AI-based services
- Spectrum Efficiency
- Revenue Growth and Monetization

Bharat 6G Vision ...

- India 6G roadmap - March 22, 2023
 - Hon'ble Prime Minister of India
- Design, develop and deploy 6G Network Technologies
- Affordability, Sustainability, and Ubiquitous Coverage
- Position India as a global leader in 6G



Government R & D Initiatives

- Technology Development Fund \$75 million per annum
- Centre for Development of Telematics (C DoT) & consortium projects more than \$50 million
- 4G/5G India Stack: Tata Consultancy Services (TCS), Tejas Networks, the Centre for Development of Telematics (C-DOT), Reliance Jio
- 5G Bharat RAN Project
 - C-DOT leading two consortiums to develop Open RAN-based 5G solutions
 - Creating a fully disaggregated, O-RAN compliant 5G RAN

- National Mission- Interdisciplinary Cyber Physical System-25 institutions in hub and spoke model
- Quantum Mission
- IndiaAI Mission – AI for All
 - AI4bharat- to position as a global leader in AI
- Anusandhan National Research Foundation (ANRF)
 - Aims to seed, grow and promote R&D and foster a culture of research and innovation
- India Semiconductor Mission (ISM) \$10 billion
- Production Linked Incentive for telecom \$1.5 billion

- Policies that encourage innovation and technology advancements
- R&D Funding for Institutions, start-up's
- Spectrum management, Infrastructure investment and consortium approach in technology development.
- Enabling technology Trials, pilots

India's Phased Approach towards 6G

■ Phase 1 (2025–2027):

- R&D, Standardization (contributions to ITU and 3GPP)
- Technology Testbeds
- Pre-Standardization Prototypes
- Spectrum trials

■ Phase 2 (2027–2030):

- Continued R&D
- Standard-based prototypes
- Pilot trials.

■ 2030 and Beyond:

- Medium-to-large scale PoC trials of standard-based prototypes
- Commercial readiness

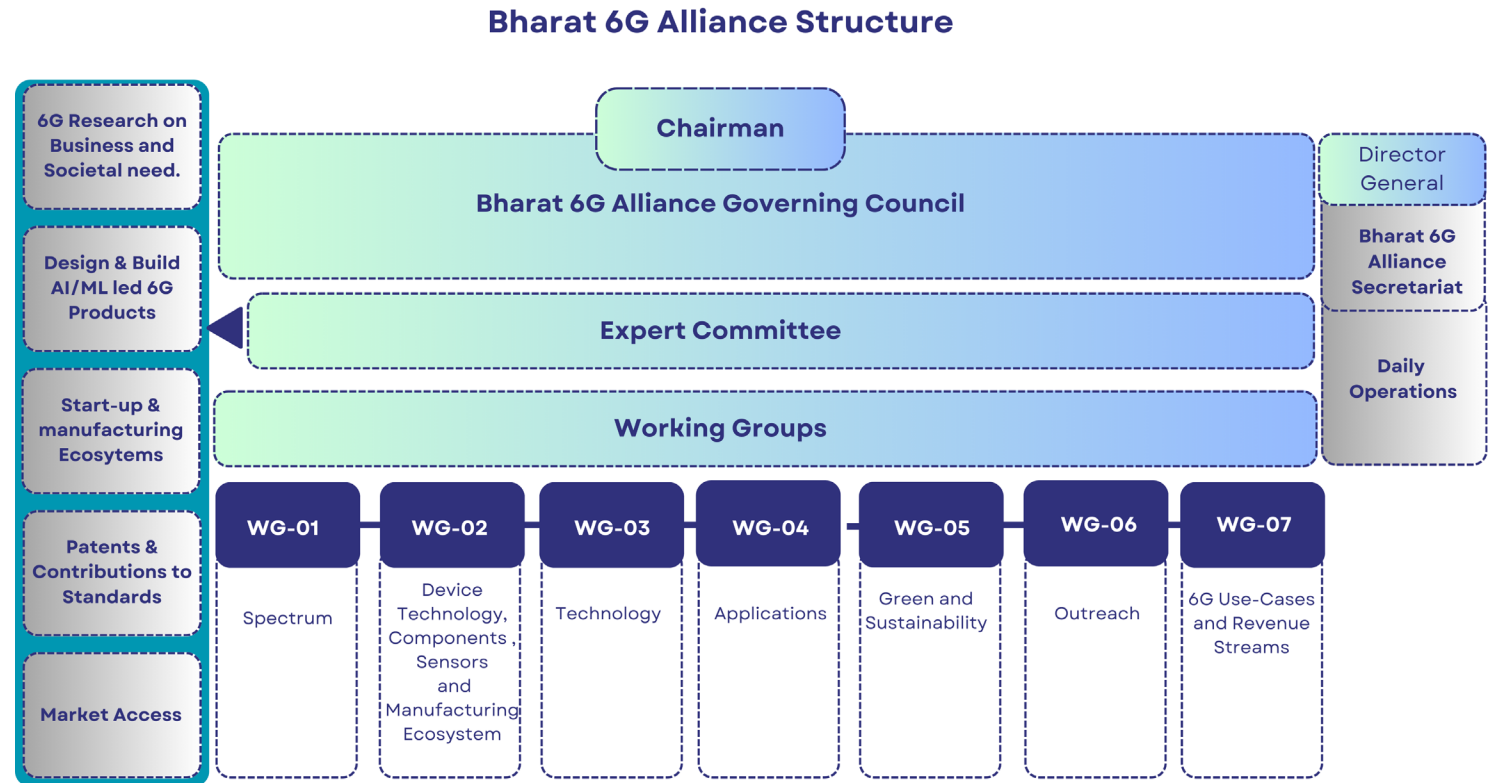
■ Current Focus on Phase 1

Bharat 6G Alliance Structure

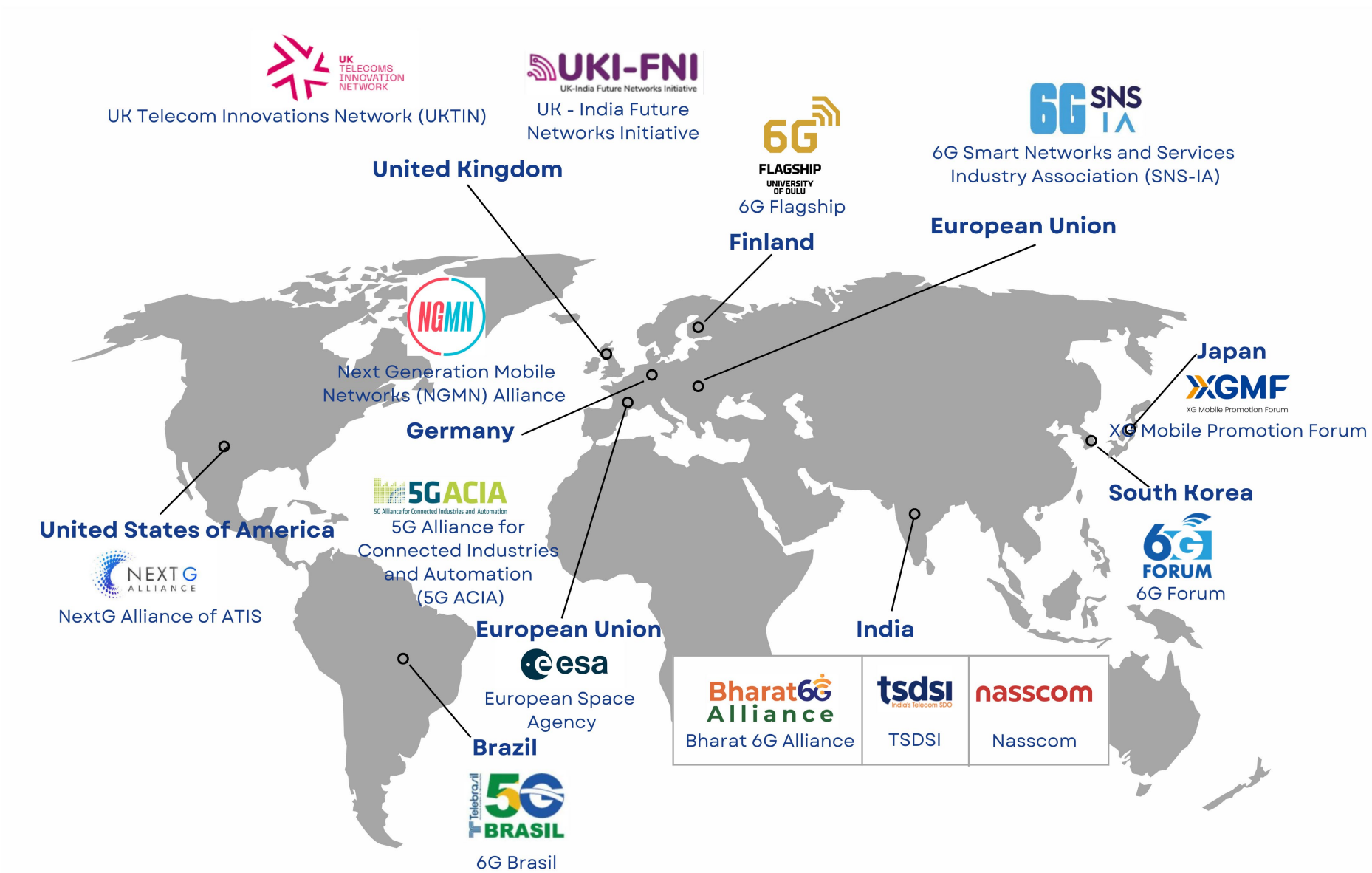
- B6GA is an industry led body consisting of public/private companies, academia, research institutions and Standard Development organizations supported by the Government
- Launched by Honorable Minister of Communications on 3rd July 2023

Working Groups

- Spectrum
- Device technology, sensors and manufacturing ecosystem
- Technology
- Applications
- Green and sustainability
- Outreach
- 6G use-cases and revenue stream



Open Collaborations



Members



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Bharat 6G Alliance Report

**SPECTRUM ROADMAP
FOR 6G IN INDIA**



Bharat 6G Alliance Report

6G APPLICATIONS



Bharat 6G Alliance Report

**TOWARDS GREEN AND
SUSTAINABLE 6G IN INDIA**

