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B6GA Post Event Report

International Bharat6G Symposium 2025

OCTOBER 9-10, 2025 | YASHOBHOOMI CONVENTION CENTRE, NEW DELHI, INDIA



2025

*"Ubiquitous, Trusted, and AI-Native 6G Networks for
a Sustainable Digital Society"*

Governing Council



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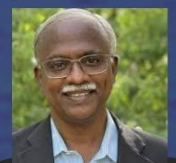
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About Event

The Bharat 6G Alliance is an initiative of Indian industry, academia, national research institutions, and standard organisations. Its purpose is aligned with the Bharat 6G Mission of the Government to design, develop and deploy technology and innovations that provide an intelligent and secure solution for high-quality living experience of citizens in India and across the world. Bharat 6G Alliance, inter alia, aims to promote the ecosystem for research, design, development, IPR creation, field testing, security, certification and manufacturing of telecom products and solutions. It has membership of more than 80. Bharat 6G Alliance has constituted seven Working Groups on different domains of 6G like Spectrum, Technology, Applications, Green and Sustainability and use cases.

In a step towards redefining the future of global communication, the Bharat 6G Alliance signed a Memorandum of Understanding (MoU) with leading research alliances like the NextG Alliance (USA), 6G IA (Europe), 6G Flagship Oulu University (Finland) 6G Forum South Korea, XGMF Japan, NGMN Alliance, 5G ACIA, UKI FNI, UK TIN, European Space Agency (ESA) and 6G Brasil (Brazil) to collaborative research and standardization. It has MOU with TSDSI and NASSCOM to utilise national synergy. These MoUs with 6G research alliances will further enable development of secure and trusted telecommunication technology including resilient supply chains.

The **International Bharat6G Symposium** stands as the premier global event for the 6G ecosystem, bringing together startups, industry leaders, academia, service providers, and policymakers in a spirit of innovation and collaboration. Bharat 6G Alliance organized the 2nd International Bharat6G Symposium 2025, on October 9–10, 2025, at the Yashobhoomi Convention Centre, Dwarka, New Delhi on Theme: ***"Ubiquitous, Trusted and AI-Native 6G Networks for a Sustainable Digital Society"*** within overall IMC 2025 theme of Innovate to Transform. This event is jointly organised by the Department of Telecommunications (DoT) and the Bharat 6G Alliance (B6GA) in partnership with leading national and international organizations. The symposium serves as a platform to shape the future of next-generation connectivity.

The event witnessed the participation of over 400 delegates from more than 20 countries, featuring 70+ distinguished speakers from across academia, industry, and government. Building on this momentum, this year's edition featured a broadened agenda covering:

- Global 6G initiatives and cooperative strategies
- AI-native networks and enabling technologies
- Non-terrestrial networks and universal connectivity
- Spectrum alignment and international standardization
- Transformative 6G use cases shaping the future

There were following thematic Sessions on 9th and 10th October 2025.

Day 1: 9th October 2025, Pushpagiri Hall

Session 1: Panel on Global 6G Initiatives

Session 2: Industry Leaders Panel: Key 6G Use Cases

Keynote Address by DG, GSMA

Session 3: Panel on Enabling 6G Technologies

Session 4: Transition towards AI-Native 6G Networks (Industry and Academic Leaders)

Keynote Address by Dr. Pemmasani Chandra Sekhar, Minister of State in the Ministry of Communications and Minister of State in the Ministry of Rural Development, Government of India

Day 2: 10th October 2025, Pushpagiri Hall

Session 5: Panel on Non-Terrestrial Networks, 6G for Space & Global Connectivity

Session 6: Harmonization of Spectrum and Standards

Fireside Chat: Semiconductor Advancements for 6G Readiness

Session 7: Roundtable – Global Cooperation in driving unified 6G roadmap

In his inaugural address, **Minister Scindia** highlighted India's readiness to lead global 6G innovation through indigenous development and strategic frameworks. He emphasized India's **future-ready spectrum policy, sovereign 6G capabilities** under the **PLI scheme**, and the **Bharat 6G Alliance's 6G Innovation Hexagon** six transformative pillars encompassing immersive communications, massive connectivity, hyper-reliable low-latency networks, ubiquitous access, AI-native design, and integrated sensing and communications. The Minister projected India's 6G ambitions to contribute **USD 1.2 trillion to GDP by 2035**, positioning India as a "**product nation**" and a global standard-setter.

Delivering the welcome address, **Prof. David Koilpillai**, Chairman, B6GA, emphasized the **triple-helix collaboration model** of academia–industry–government as central to building a self-reliant 6G ecosystem.

1. **The New Delhi Declaration** – A landmark joint statement titled "*Endorsing Principles for 6G: Secure, Open, Resilient, Inclusive, and Sustainable by Design*", co-signed by Bharat 6G Alliance, 6G-IA, NextG Alliance, XGMF, 6G Forum, 6G Brazil, UKI-FNI, UK TIN, NGMN Alliance, and others, reaffirming a unified global vision for inclusive and secure 6G development. The *New Delhi Declaration* affirms that 6G networks will be designed to be:

- Trusted and Secure
- Resilient and Reliable
- Open and Interoperable
- Inclusive and Affordable
- Sustainable and Globally Connected

Sustainability is placed at the core, with a focus on energy efficiency and universal coverage through the integration of terrestrial and non-terrestrial (satellite, high-altitude platform) networks. **The declaration highlights the need for continual skills development and calls upon all stakeholders, governments, industry, academia to work together so 6G uplifts societies and leaves no one behind.**

The **International 6G Symposium 2025** reaffirmed India's commitment to advancing indigenous telecom capabilities while fostering global collaboration. With a focus on innovation, affordability, and inclusivity, India continues to pave the way for a **connected, self-reliant, and future-ready 6G ecosystem** aligned with its vision for '**India 6G Vision 2030**'.

2. **MoU Collaborations** –

- **Bharat 6G Alliance–NASSCOM:** MoU to integrate India's tech industry, startups, and research ecosystem into 6G innovation.
- **Bharat 6G Alliance –ESA:** MoI with the **European Space Agency** to advance collaboration on **non-terrestrial networks** and **satellite–terrestrial integration** through ESA's 5G/6G Hub in the UK.

3. **Release of Four Whitepapers** by Bharat 6G Alliance Working Groups:

- *Spectrum Roadmap for 6G in India* - Proposing a structured spectrum strategy for 6G trials and deployment.
- *Powering the Next-Gen Telecom* - Addressing energy efficiency in 6G macro and small-cell networks.
- *AI and Network Evolution to 5G Advanced and 6G* - Outlining AI-native architectures for intelligent network management.
- *6G Data Architecture, Security, and Exposure Framework for RF Sensing* - Defining secure frameworks for integrated sensing and communications.

Together, these initiatives reaffirm India's commitment to shaping an open, sustainable, and inclusive **6G future**, strengthening its role as a key driver of global innovation and digital transformation.



Inauguration

The International Bharat6G Symposium 2025, held on October 9–10, 2025 in New Delhi alongside the India Mobile Congress 2025, was inaugurated by **Shri Jyotiraditya M. Scindia**, Hon'ble Minister of Communications; and Minister of Development of North Eastern Region, Government of India at Yashobhoomi, Dwarka, New Delhi on 8th October 2025, in the august presence of Dr. Neeraj Mittal, Secretary (Telecom), Department of Telecommunications, Government of India.

The symposium witnessed the presence of senior government officials, global experts, industry leaders and academicians. Organized by the Department of Telecommunications (DoT) and the Bharat 6G Alliance, the two-day symposium brought together more than 70 experts from Japan, the UK, the US, Europe, and India. The event built upon the 2024 symposium's vision by highlighting concrete progress in international collaboration, AI-native architecture, spectrum policy, and standards alignment saw the participation of over 400 attendees, making it a milestone international gathering.



Hon'ble Minister Shri Jyotiraditya M. Scindia in his inaugural speech said, *“India has built a future-ready policy and a spectrum framework enabling timely allocation of even the terahertz band to support next-generation networks. From our indigenous 4G and 5G stacks to Open RAN prototypes for 6G, we are developing sovereign capabilities under the PLI scheme. The Bharat 6G Alliance, uniting 80+ organizations and 30 startups, is pioneering AI-native networks and cross-sector applications in agriculture, healthcare, smart cities, and sustainability. Through the 6G Innovation Hexagon, our framework of six transformative*

pillars- immersive communications, massive communications, hyper-reliable low-latency connectivity, ubiquitous connectivity, AI-native networks, and integrated sensing and communications, India is not following the future, it is creating it.”



India's 6G ambitions are projected to contribute \$1.2 trillion to the country's GDP by 2035, said Union Minister for Communications Shri Jyotiraditya Scindia. He emphasized that India's vision extends far beyond 5G, with the Bharat 6G Alliance driving efforts to secure 10% of global 6G patents and play a leading role in setting future connectivity standards. He said India is emerging as a "product nation", rather than just a service economy one that creates as well as consumes.



In his welcome address, Prof. David Koilpillai, Chairman, Bharat 6G Alliance underscored the pivotal role of the triple-helix model collaboration between academia, industry, and government in driving India's 6G readiness. He highlighted that the creation of a truly indigenous 6G ecosystem will hinge on innovation, interoperability, and sustainability, enabling India to emerge not just as a participant but as a global leader in next-generation telecommunications. Since last year's symposium, three major milestones have been announced to strengthen India's role in global 6G co-innovation:

❖ New Delhi Declaration "Joint Statement Endorsing Principles for 6G: Secure, Open, Resilient, Inclusive, and Sustainable by Design."



The New Delhi Declaration was announced at the International Bharat6G Symposium 2025 by research alliance **Bharat 6G Alliance**, **6G Smart Networks and Services Industry Association (6G-IA)**, **NextG Alliance**, **XGMF**, **6G Forum**, **6G Brazil**, **UKI-FNI**, **UK TIN**, **NGMN Alliance**, **UK Federated Telecoms Hubs (CHEDDAR, HASCO, JOINER and TITAN)**, and **6G Flagship**. The declaration reaffirmed that 6G must be designed to be secure, open, resilient, inclusive, and sustainable. This landmark declaration was released by MOU partners on October 10, 2025, during the Valedictory session. This declaration represents a unified global vision to make 6G a secure, intelligent, and inclusive network fabric that empowers every nation and citizen, accelerates digital economies, and leaves no one behind.

❖ MoU Exchanges

- MoU with NASSCOM: To integrate domestic industry, startups, and research ecosystems into 6G innovation.

National Association of Software and Service Companies (Nasscom) represent the voice of over \$254 billion technology industry in India with the vision to establish the nation as the world's leading technology ecosystem. With over 3000 member companies, the network spans the entire spectrum of the industry from DeepTech and AI start-ups to multinationals and from products to services, Global Capability Centres to Engineering firms.



- MoI with ESA (European Space Agency): To enhance collaboration in non-terrestrial networks and satellite–terrestrial integration.



The European Space Agency (ESA) Telecom Hub in the UK is a research and innovation center focused on advancing converged satellite and terrestrial communication networks. Also known as the 5G/6G Hub. The hub provides a collaborative environment for companies within the 5G/6G ecosystem including satellite operators, terrestrial network providers, and application developers to test and develop new technologies. It aims to integrate satellite and ground networks seamlessly to provide reliable, ubiquitous connectivity. The facility provides a testing ground with a converged satellite and 5G/6G terrestrial network. This allows for the development of innovative applications in areas like smart cities, autonomous vehicles, and the Internet of Things (IoT).

❖ Release of four Whitepapers:

During inauguration 4 whitepapers by Working Groups of Bharat 6G Alliance were released namely:

Spectrum Roadmap for 6G in India

Spectrum roadmap paper assesses India's current spectrum landscape for IMT services, identifies gaps vis-à-vis future data traffic growth, and examines evolving wireless technology trends—including NTN, HAPS, HIBS, Ambient IoT, Satellite Direct-to-Device, Drone connectivity, and V2X. It highlights the importance of a National Spectrum Strategic Roadmap to support ongoing 5G expansion, adoption of 5G Advanced, and initial 6G trials. The whitepaper provides a high-level view of spectrum requirements, outlines potential IMT spectrum bands under discussion in global forums, and recommends a structured five-year plan (short-term: 2025, medium-term: 2027, long-term: 2030 and beyond), along with policy measures for regulatory sandboxes and early experimentation.



Powering the Next-Gen Telecom (Towards energy efficiency in 6G Macro and Small cell deployments)

The advent of 6G promises to revolutionize connectivity, ushering in an era of hyper-connected devices and seamless experiences. However, this transformative technology comes with a significant energy consumption challenge. As 6G networks grow in complexity and scale, energy efficiency becomes a critical factor in ensuring sustainable and cost-effective deployments. Environmental, Social, and Governance (ESG) disclosures reveal a growing emphasis on energy-efficient network technologies, AI-driven optimization, renewable energy procurement, and phasing out legacy systems. This whitepaper delves into energy efficiency issues and considerations for 6G macro and small cell deployments, exploring innovative techniques and technologies to optimize power consumption while maintaining performance and reliability.



AI and Network Evolution to 5G Advanced and 6G: Native AI, Infrastructure Implications, and Global-India Perspectives

The shift from 5G Advanced to 6G is set to revolutionize telecom networks, transitioning from traditional systems to AI-native frameworks that are deeply integrated across every layer of the network. This white paper delves into the significance of AI-driven networks and their transformative role in the evolution of 5G Advanced to 6G. From self-optimizing systems to AI-powered orchestration, the paper explores how AI-native architecture will provide real-time adaptability, reduce operational complexity, and elevate service delivery.



6G Data Architecture, Security and Exposure Framework for RF Sensing

The white paper explores the 6G data architecture required to enable integrated sensing and communication (ISAC) capabilities, emphasizing the use of radio frequency (RF) sensing to unlock new applications across industries. It provides a detailed analysis of architecture, security, privacy, and exposure challenges, while proposing a framework to address these issues. The document also highlights potential use cases, such as pollution monitoring, next-gen railways, and smart cities, and discusses the monetization opportunities and technical advancements necessary for successful implementation.



These milestones, together with expanding 6G alliances across regions, reflect a collective movement from vision to action. The Bharat 6G Alliance represents India's transformation from a technology consumer to a technology contributor, leveraging international collaborations and domestic innovation to shape a globally inclusive 6G future. By leveraging international partnerships and nurturing indigenous capabilities, B6GA is laying the foundation for **Atmanirbhar Bharat in 6G** while ensuring that the benefits of advanced connectivity reach every corner of the country.

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Curtain Raiser of Digital Communications Theme within ESTIC 2025 by Department of Telecommunications

Day 1: 9th October 2025, Pushpagiri Hall

Setting the Tone for Atmanirbhar Bharat 6G

“Setting the Tone for Atmanirbhar Bharat 6G” marked a significant beginning to the International Bharat 6G Symposium 2025 on 9th October 2025 at Pushpagiri Hall, setting the strategic direction for India’s self-reliant 6G journey.

The Emerging Science, Technology, and Innovation Conclave (ESTIC) is India's premier STI platform, bringing together ministries, innovators, and global visionaries. A flagship annual event, ESTIC fosters collaboration, celebrates disruptive innovation, and drives forward the vision of "Viksit Bharat 2047." This transformative platform will showcase cutting-edge research, deep-tech breakthroughs, and thought-provoking discussions with Nobel Laureates, global experts, policymakers, and emerging leaders - igniting a new era of scientific leadership.

The ESTIC-2025 is being jointly organised by 13 Ministries and Departments of the Government under the guidance of the Principal Scientific Adviser (PSA) to the Government of India. The conclave will be held from 3 to 5 November 2025 at Bharat Mandapam, New Delhi, with the theme “Viksit Bharat 2047 – Pioneering Sustainable Innovation, Technological Advancement, and Empowerment”.

Department of Telecommunications organised a Curtain Raiser for the upcoming Emerging Science, Technology & Innovation Conclave (ESTIC-2025) at this event on 9th October 2025. As one of the key organisers, DoT is leading the thematic session on “Digital Communications”, one of the 11 thematic sessions at the conclave.

A Brief Presentation on the “*Digital Communications Theme within ESTIC 2025*” was delivered by **Shri Ashok Kumar, DDG SRI**, offering an overview of India’s digital communication roadmap and key focus areas under the ESTIC framework. Prof. Ajay Sood, Principal Scientific Adviser to Government of India in august presence of Dr. Neeraj Mittal, Chairman, Digital Communications Commission and Secretary, Telecom, Department of Telecommunications unveiled the Curtain Raiser of the Digital Communications Theme, symbolizing India’s commitment to pioneering research and innovation in next-generation networks. The theme video covered the achievement in Telecom sector during last 11 years.

Prof. Ajay Sood, Principal Scientific Adviser to the Government of India in his Keynote Address highlighted the critical role of scientific innovation and interdisciplinary research in building a robust 6G ecosystem. He emphasized that the Government of India is driving telecom innovation through a strategic, multi-pronged approach that supports indigenous R&D, strengthens local manufacturing, expands digital access via Digital Bharat Nidhi and fosters collaboration across government, academia and industry. He acknowledged that the 6G symposium is a global call to action to build faster, smarter, inclusive, and sustainable networks

that empower societies and improve lives. 6G has the potential to transform industries, enhance public services, and create groundbreaking experiences.





The session concluded with a Vote of Thanks by Shri Anil Kumar Bhardwaj, DDG SE, Department of Telecommunications, acknowledging the contributions of all speakers and participants, and emphasizing the importance of joint efforts to realize India's 6G vision.

This session also set the tone for the two-day symposium, reflecting India's commitment to driving technological leadership, fostering innovation, and enabling Atmanirbhar Bharat 6G a self-reliant, globally connected, and future-ready digital ecosystem.



Keynote Addresses

Keynote Address by Dr. Pemmasani Chandra Sekhar, Minister of State in the Ministry of Communications and Minister of State in the Ministry of Rural Development, Government of India



The minister emphasized India's growing global leadership in telecommunications and digital innovation. He highlighted that the **Department of Telecommunications (DoT)**, in close partnership with industry and key stakeholders, has been successfully hosting the **India Mobile Congress (IMC)** South Asia's most iconic digital and telecom platform. The IMC now attracts over **100,000 visitors from 150 countries**, including **600 startups and 400 exhibitors**, demonstrating India's commitment to openness, partnership, and global collaboration.

The Minister underscored India's proactive engagement with international standardization bodies such as **3GPP** and the **International Telecommunication Union (ITU)**, reaffirming the nation's role in shaping the global telecom agenda. Over **80 institutional members** across the telecom ecosystem are contributing to this vision, reflecting India's collective strength in research, innovation, and development. Bharat 6G alliance signed MoU with Global 6G alliance for knowledge sharing developing ecosystem.

Highlighting India's leadership in next-generation technologies, Dr. Pemmasani shared that the **130 cutting-edge projects** across deep-tech domains, supported by investments exceeding

USD 30 million in joint research programs, prototype development, and standard-essential IP creation.

Dr. Pemmasani noted that India now **manufactures 99% of its mobile phones domestically** and has achieved **60% import substitution** in telecom and network equipment.

He concluded by emphasizing India's exceptional **STEM talent pool** and the country's strategic transition from a *knowledge destination* to a *technology superpower*. Dr. Pemmasani reaffirmed the Government's commitment to building a **resilient, innovation-driven ecosystem** under the **Bharat 6G Vision Roadmap**, driving the nation toward an intelligent, secure, and inclusive digital future.



Keynote Address by Mr. Vivek Badrinath, GSMA

Mr. Vivek Badrinath, Director General of the **GSMA**, lauded India's rapid progress in telecommunications and its emergence as a **global technology innovator**. Recalling that the nation has advanced from its first mobile call three decades ago to serving **over 1 billion unique mobile users** and connecting **760 million people to mobile internet**, he highlighted the sector's contribution of approximately **12 percent of India's GDP about USD 370 billion**.

Mr. Badrinath commended India for executing the **world's fastest 5G rollout**, which now covers **82 percent of the population** and serves **over 365 million users**. He noted that India has transformed from a digital consumer into a **global producer of technology, standards, and services**, with innovations such as **Aadhaar, IndiaStack, and UPI** benefiting not only India but societies worldwide. He emphasized that **6G development must build upon the solid foundations of 5G**, preserving the value of existing investments while enabling a **modular and scalable transition**. Highlighting real-world applications such as **drone-assisted agriculture, smart irrigation, 5G-enabled emergency healthcare, and smart urban infrastructure**, he underlined that many of the capabilities envisioned for 6G are already being realized through 5G.



Maximizing these achievements, he said, will make 6G adoption in the 2030s more efficient and economically viable.

Turning to **policy priorities**, Mr. Badrinath stressed the importance of **transparent, long-term regulatory frameworks** that promote innovation, ensure cybersecurity, and guarantee inclusivity. Commending the **Bharat 6G Alliance (B6GA)** as a pioneering platform uniting government, industry, and academia, he noted that India's leadership must also ensure **digital inclusion**.



Presentation by Mr. Ross Bateson, GSMA Study on 6G Spectrum Needs

Mr. Ross Bateson emphasized that the evolution from **5G to 6G** will redefine both the technological and experiential landscape of global connectivity. He projected that by **2030–2040**, mobile communications will move beyond the confines of rectangular handheld screens toward **immersive, holographic, and AI-driven experiences**. These “disruptor technologies,” he noted, already form part of high-demand forecasts and are attracting significant worldwide investment, suggesting that their materialization is not speculative but imminent.

Presenting GSMA’s forward-looking spectrum analysis, he forecast a requirement of **2–3 GHz of additional globally harmonized spectrum by 2035–2040**, with high-usage markets potentially demanding up to 4 GHz. He stressed the importance of **balanced spectrum planning**, accounting for application-specific needs—such as AI’s increasing uplink demand and low-latency channel requirements—alongside realistic network-density assumptions. He expressed enthusiasm for continuing this dialogue at the upcoming **Mobile World Congress (MWC) Doha**, where the GSMA will release its detailed **6G Traffic Demand and Spectrum Requirement Report** ahead of **WRC-27**, helping shape the roadmap for 6G implementation in the latter half of the decade.



MoU Exchange between IIT Delhi and Keysight Technologies for 6G NTN OTFS Waveform Development

A Memorandum of Understanding (MoU) was exchanged between **IIT Delhi** and **Keysight Technologies** during the International Bharat6G Symposium 2025. The collaboration aligns with B6GA's objective of developing indigenous 6G Intellectual Property (IP) in India and taking it to the global stage.

Developed by Professor Saif Khan Mohammad and his team at IIT Delhi, the Orthogonal Time Frequency and Space (OTFS) waveform is a leading candidate technology for Non-Terrestrial Networks (NTN) in 6G, owing to its robustness in high Doppler and high delay environments. Recognizing its significance, Keysight Technologies, a global leader in test and measurement, will integrate the OTFS IP into its Vector Signal Analyzer (VSA) platform for worldwide use by 6G developers.

This collaboration represents the **first-of-its-kind productization of 6G IP** developed in India and its adoption by a global technology leader. It signifies both technical and commercial validation of Indian innovation and marks a significant step forward toward realizing **Bharat 6G Alliance's vision of global leadership in 6G development**.



Session 1: Panel on Global 6G Initiatives

(Objective: Discussion of 6G initiatives across US, UK, Japan, S. Korea, Europe and India)

Moderator:

- Prof. Bhaskar Ramamurthi, IIT Madras

Session Speakers:

- Prof. Harald Haas, Future Telecoms, UK
- Dr. Hosako Iwao, NICT, Japan
- Dr. Magnus Frodigh, Vice Chair of Hexa-X, Europe
- Dr. Ashutosh Dutta, IEEE Future Networks, Johns Hopkins University, USA
- Prof. David Koilpillai, Chairman, Bharat 6G Alliance and Professor, IIT Madras

Discussion Highlights:

The session provided an in-depth view of global 6G research priorities and strategic directions across regions. Panellists shared insights on emerging technologies, spectrum strategies, and collaborative opportunities shaping the future 6G landscape.



- **Enhanced Capacity and New Spectrum Utilization:**

The panellist highlighted that downlink speeds are expected to double in 6G, with a substantial increase in total network capacity (uplink and downlink) driven by the allocation of new spectrum bands. This expansion will enable more data-intensive applications and support ultra-high throughput services.

- **Integrated Sensing and Communication (ISAC):**

The resolution capabilities of ISAC systems will depend on the specific use cases, such as drone operations, network density, and frequency bands employed. This adaptability will allow 6G networks to support diverse applications requiring precise localization and sensing.

- **Spectrum and Propagation Challenges:**

The panel noted that 6G will operate at higher frequencies, including cm-wave bands around 7 GHz, which present unique propagation challenges, particularly in tropical regions with high rainfall. Uplink remains power-limited, necessitating flexible strategies to decouple uplink and downlink operations.

- More Uplink-Centric Services: New 6G services will require higher uplink capacity to support real-time responsiveness, making optimal use of lower frequencies for uplink crucial.
- TDD vs. FDD Considerations: While TDD operation is constrained by time-division coordination, FDD can offer greater flexibility for uplink but requires careful planning for downlink due to line-of-sight considerations.

- **Non-Terrestrial Networks (NTN) and Optical Communication:**

The panellists emphasized massive digital twin applications and the critical role of NTN, including High-Altitude Platform Stations (HAPS).

- Japan is targeting HAPS-based NTN trials by 2026, with the first demonstrations expected soon after.
- Optical communications, including free-space optical links and Li-Fi for indoor access, will be pivotal. These operate in unregulated optical spectrum, offering significant capacity and energy efficiency but facing challenges such as attenuation and commercial deployment considerations. Optical MIMO systems represent a new market frontier.
- The concept of “All-Photonics Networks” was discussed as a pathway to high capacity, low latency, and energy-efficient connectivity, especially suitable for short-range and dense traffic scenarios in an AI-native society.

- **Energy Efficiency Imperatives:**

The discussion also stressed the need to look beyond absolute energy use to energy consumption per capita, ensuring that sustainability remains integral to 6G deployment strategies.

- **Fixed Wireless Access (FWA) and Ubiquitous Connectivity:**

Drawing from US developments, Panelists noted that FWA is gaining traction as a key 6G use case. Achieving ubiquitous connectivity will require optimized cell mobility

management and seamless integration of NTN and terrestrial networks, ensuring consistent quality of experience across heterogeneous environments.

- **Device Evolution and Compatibility:**

Panellists emphasized that 6G will require a new generation of devices, and existing 5G devices cannot simply be upgraded through software to support 6G capabilities. New hardware architectures will be needed to handle higher frequencies, advanced sensing functions, and enhanced uplink performance, underscoring the importance of early device ecosystem development in parallel with network evolution.

Session 2: Industry Leaders Panel: Key 6G Use Cases

(Objective: Explore promising use cases of 6G)

Moderator:

- Mr. Robert Ravi, Chairman and Managing Director, Bharat Sanchar Nigam Limited

Session Speakers:

- Mr. Sachin Mehta, Airtel
- Dr. Dilip Krishna swamy, C DoT
- Mr. Jayanta Dey, HFCL
- Dr. Magnus Ewerbring, Ericsson
- Ms. Anita Doehler, NGMN Alliance
- Mr. Charles Santhosam, Nvidia

Discussion Highlights:

The panel brought together perspectives from operators, technology leaders, and industry innovators to identify priority 6G use cases and outline the enabling ecosystem required for their realization.

- **Strategic Role of Use Cases in 6G Development:**

Panelists underscored that identifying clear, scalable use cases is critical to guiding technology evolution and standards development. Unlike blanket rollouts, use case-based industrial deployments should lead 6G adoption. These deployments must be commercially viable, sustainable, and enable new monetization opportunities for operators and industry players.

- **Operator Perspectives:**

6G will mark a shift from connected to cognitive networks, emphasizing intelligent network behaviour and seamless service integration. Affordable chipsets and software-based upgrades on existing infrastructure are essential to enable smooth adoption. Radio hardware should be upgradable to 6G, allowing cost-effective evolution without

full-scale replacement. Operators stressed the need for network and operational simplification, ensuring 6G deployments are manageable and efficient.



- **Key 6G Use Cases Identified:**

Enhanced Human Communication: XR and immersive holographic telepresence, multimodal communication, and real-time collaborative experiences.

Enhanced Machine Communication:

- Collaborative robots (cobots) and robot network fabrics for industrial automation.
- 3D hyper-accurate positioning, localization, and tracking services.
- Interactive mapping, digital twins, and virtual world creation.

AI-Native Network Evolution: Trusted Native AI and AI-as-a-Service (AIaaS) will be central to 6G networks, enabling intelligent, automated operations and services.

- **Compute and Network Convergence:**

The panel highlighted that AI and compute will become integral to the 6G stack. Physical layer data export, collocated GPU capabilities, and memory-based interfaces will reduce overheads and allow real-time processing for ISAC and AI-driven applications. AI agents will help optimize network operations (e.g., cell on/off prediction using LLMs) and support new application types in real time. Exploring the smallest form factor GPUs for deployment at the edge will enable on-site intelligence and faster response times.

- **India-Specific Use Cases and Innovations:**

DRISTI and Reconfigurable Intelligent Surfaces (RIS) deployed on hilltops were showcased as examples of India's unique use-case exploration. Ubiquitous coverage through elliptical orbit satellite constellations (20 satellites currently in use) was discussed as a solution to challenging terrains. Coordinated communication and sensing from spacecraft, radar integrated with OFDM, and AI integration in network stacks were identified as key innovation areas. Defence-focused use cases, such as sensing drones, were highlighted for strategic applications.

- **Integrated Sensing and Communication (ISAC) and Ambient IoT:**

Panelists emphasized ISAC as a major 6G use case, with applications in early flood warning systems, precision agriculture, industrial IoT, and disaster management.

- Ambient IoT, involving billions of low-power connected devices, was identified as a critical design consideration for 6G networks.
- LP-WAN enablement through 6G will support large-scale IoT deployments with high spectral and energy efficiency.

- **Sustainability and Scalability:**

All use cases must be energy-efficient, commercially deployable, and scalable, ensuring that 6G technology creates both business value and societal impact.

Session 3: Panel on Enabling 6G Technologies

(Objective: Exploring foundational/emerging technology enablers for 6G, and ways of international cooperation between academia and industry)

Moderator:

- Prof. Rohit Budhiraja, IIT Kanpur

Session Speakers:

- Prof. Mathini Sellathurai, Heriott Watt University, Scotland
- Dr. P Hanumantha Rao, SAMEER
- Prof. Nandana Rajatheva, University of Oulu, Finland
- Prof. Erik Strom, Chalmers University, Sweden
- Prof. Debarati Sen, IIT Kharagpur
- Prof. Deepa Venkitesh, IIT Madras
- Prof. Kaveh Delfanazari, University of Glasgow, UK

Discussion Highlights:

The session focused on the core technology building blocks that will shape the 6G era, including advanced hardware, photonics, AI-native architectures, non-terrestrial integration,

security, and sustainability. Panellists highlighted the need for deep R&D investments, interdisciplinary collaboration, and coordinated global efforts to translate these emerging technologies into scalable real-world deployments.

A key area of discussion was **emerging photonics technologies**, which are expected to play a transformative role in enabling ultra-high-speed, low-latency communication. Innovations in high-speed transceivers, optical fiber infrastructure, advanced optical signal processing, free-space optics, and Li-Fi will enable new communication paradigms. Quantum Key Distribution (QKD) was identified as an essential layer to enhance network security. THz and optical testbeds were highlighted as critical for supporting data-intensive applications such as digital twins, immersive XR, and industrial automation.



The panel placed strong emphasis on **6G-ready hardware** and material innovation. High-power and highly integrated devices based on GaAs, GaN, InP, SiGe, and CMOS will form the foundation of future 6G systems. Material choice, device design, and scalable manufacturing will be decisive in overcoming performance and cost challenges. The 7 GHz deployable band was identified as a promising frontier, but one that requires extensive research in front-end systems, power amplifiers, and thermal management. Panelists stressed that significant R&D investment in devices, components, SoCs, and RFICs will be essential to enable cost-effective large-scale deployment.

Another major theme was the evolution of **AI-native networks**. Intelligence will be embedded directly into the network fabric, moving beyond the current model of adding AI as an external layer. AI/ML-driven air interfaces will support adaptive waveforms and protocols that can learn

and optimize in real time. Doppler-resilient waveforms such as OTFS and its variants were discussed as potential candidates for high-mobility environments. Multimodal sensing capabilities will enable dynamic digital twins and real-time situational awareness, supporting a range of advanced applications.

The panel also underscored the importance of **integrating non-terrestrial networks (NTN) with terrestrial 6G infrastructure** to enable global coverage. This will require the development of low-power hardware, green protocols, and sustainable materials, ensuring that 6G aligns with global sustainability goals and remains viable over the long term. Security and resilience were highlighted as critical pillars, with post-quantum cryptography emerging as a key tool to safeguard future networks. New KPIs for resilience, energy per bit, and context awareness will need to be evolved, moving beyond traditional throughput and latency metrics.

Finally, participants discussed the future of 6G as a **hybrid quantum–THz ecosystem**, combining precision timing at the physical layer, quantum communications, and massive machine-type communications to achieve higher speeds, lower latency, and enhanced security. These enabling technologies will underpin a broad range of transformative applications spanning digital twins, immersive XR, industrial automation, and smart healthcare. The panel emphasized the need for a strategic 6G research roadmap, strong academia–industry collaboration, and global testbeds to accelerate innovation and standardization.

Session 4: Transition towards AI-Native 6G Networks (Industry and Academic Leaders)

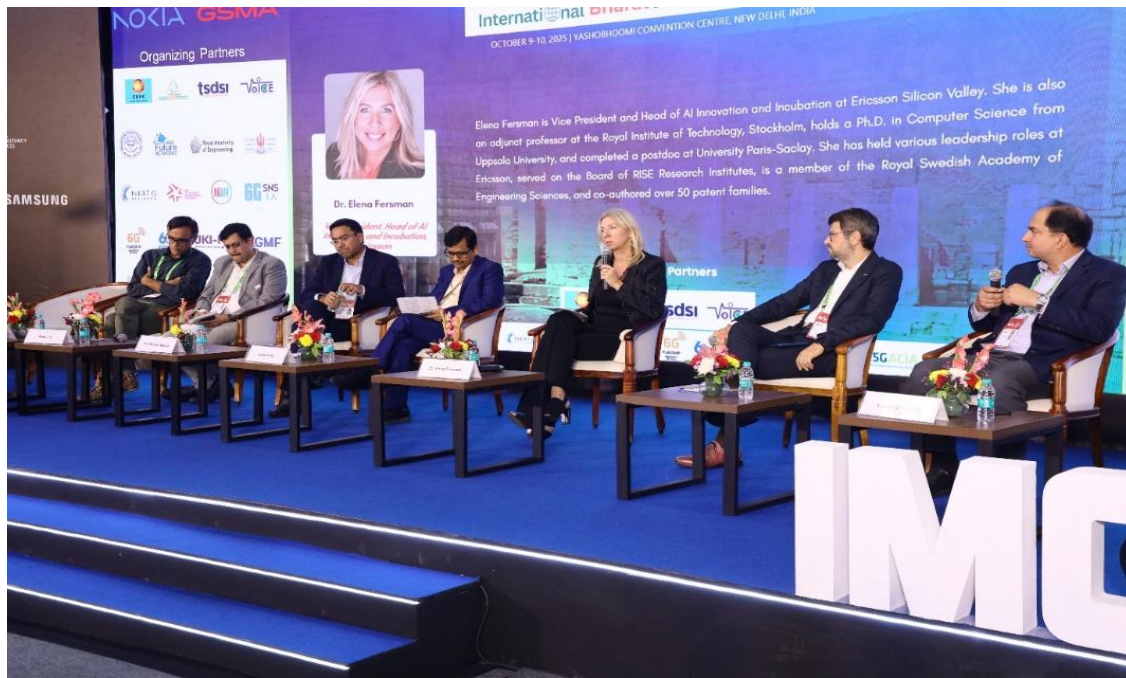
(Objective: To transition towards autonomous 6G networks)

Moderator:

Shri Ashok Kumar, Bharat 6G Mission Head & DDG(SRI), Department of Telecommunications

Session Speakers:

- Prof. Mahesh Marina, University of Edinburgh, UK
- Dr. Elena Fersman, Ericsson
- Dr. Simone Redana, Nokia
- Mr. Sandeep Sharma, Tech Mahindra
- Mr. Ramu T S, Lekha Wireless
- Prof. Rohit Budhiraja, IIT Kanpur



Discussion Highlights:

This session explored AI as the defining feature of 6G, focusing on how intelligence will be deeply embedded across the entire network stack to enable autonomous, self-optimizing 6G networks. Talks highlighted the importance of introducing learning loops at every layer—from radio scheduling to service orchestration—enabling networks that can perceive, reason, and adapt dynamically to changing conditions.

A key theme was the shift from data-centric automation to semantic, AI-governed systems, requiring open APIs, secure data sharing frameworks, and robust ethical governance. Panelists agreed that transitioning to AI-native 6G networks will involve rethinking current architectures and operational models to support decentralized intelligence and context-aware decision-making in real time.

The panel discussed the role of agentic AI in telecommunications, characterizing it as an orchestrator capable of managing complex, multi-layered systems. Different layers of the network can leverage **real-time AI agents** to address distinct operational needs—such as RAN optimization, service orchestration, and resource allocation—while working in concert to achieve network-wide objectives. The higher the network layer, the stronger the requirement for real-time decision-making and responsiveness from these agents.

Panelists also examined the distinction between AI-enabled and AI-native networks. While 4G relied on rule-based algorithms and 5G introduced AI engines for specific tasks like load balancing, 6G will involve **deeper, systemic integration of AI capabilities across all layers of the network**. In an AI-native architecture, compute and intelligence are embedded natively, enabling seamless data access and unified control, rather than relying on siloed AI modules.

The discussion emphasized that building AI-native networks will require close industry–academia collaboration, standardization of open and interoperable interfaces, and the development of trust frameworks to ensure security, privacy, and accountability. By embedding intelligence into the fabric of the network, 6G aims to deliver unprecedented levels of automation, adaptability, and service personalization.

Session 5: Panel on Non-Terrestrial Networks, 6G for Space & Global Connectivity

(Objective: Discussing satellite-terrestrial integration, 3D networks topologies, and connectivity for remote regions)

Moderator:

- Prof. Mike Short, UK

Session Speakers:

- Prof. Rahim Tafazolli, University of Surrey, UK
- Dr. Dilip Krishnaswamy, C-DOT
- Dr. Veena Rawat, GSMA
- Lt. Col VS Velan, Elena Geo System
- Mr. Amitabh Madathil, Airtel



Discussion Highlights:

Satellite–Terrestrial Convergence & D2D: The session highlighted the growing importance of satellite–terrestrial convergence and Direct-to-Device (D2D) communication as key

enablers for achieving global connectivity in the 6G era. With 4.7 billion people already connected to mobile internet using their own devices, leveraging D2D in existing mobile spectrum offers a cost-effective and scalable pathway to bridge coverage gaps. Panellists underscored that WRC-27 agenda items (AI 1.12, 1.13, 1.14) will play a critical role in shaping spectrum allocation for Mobile Satellite Services (MSS) and D2D. Several countries, including Australia, Canada, and the United States, are already formulating national policies to support these developments.

Standards, Spectrum & Regulatory Framework: Discussions focused on the evolution of standards, spectrum use, and regulatory frameworks for Non-Terrestrial Networks (NTN). 3GPP Release 17 has laid the foundation for 5G NR-NTN, while Release 18 will bring enhancements to support satellite integration. Unlike 5G, where satellite networks primarily interworked with terrestrial systems, 6G will enable a unified 3D network architecture. However, standardization and regulatory clarity remain time-intensive processes, directly affecting commercialization timelines. Spectrum coordination between satellite and terrestrial networks poses significant challenges, particularly in India where the 800 MHz–3 GHz band is already heavily utilized by mobile services.

Technical Integration Challenges: The panel explored several technical challenges associated with integrating NTN and terrestrial networks. Achieving seamless satellite–terrestrial integration requires addressing uplink power limitations, designing advanced antennas, and incorporating new RF bands in handsets. Solutions such as Space MIMO, cell-free architectures, and distributed MIMO in space are being investigated to manage the complexities of time–frequency–space coordination. Additionally, satellite systems typically rely on proprietary standards with a limited number of suppliers, which increases costs. Panellists noted that as 6G convergence advances, economies of scale and standardization are expected to bring costs down.

Operator Perspectives & Commercial Considerations: From the operator perspective, the discussion emphasized the need to build resilient networks, encourage healthy competition, and develop sustainable business models for extending coverage using NTN. While terrestrial mobile services in India are among the most affordable globally, satellite services may remain relatively expensive. This raises the need for innovative pricing mechanisms and shared infrastructure models to ensure viability. Defence applications emerged as a critical driver, with specific use cases involving lightweight soldier devices, cross-border coverage, and spectrum sharing.

Innovation & Collaboration: The session also highlighted emerging innovation and international collaboration. One of the panellists introduced NISHA, a network of interlinked satellites designed to ensure high availability and seamless integration with cellular networks. Participants stressed the importance of international cooperation across regulatory, spectrum, and technical domains to enable successful NTN–TN convergence. Beyond coverage extension, additional drivers such as precise navigation, timing, earth observation, and indoor positioning are expected to shape the evolution of non-terrestrial networks in the 6G era, unlocking a wide range of new applications and services.

Session 6: Harmonization of Spectrum and Standards

(Objective: Alignment of international standards and spectrum frameworks for 6G)

Moderator:

- Shri S. T. Abbas, Telecom Engineering Centre, Department of Telecommunications

Session Speakers:

- Mr. Lorenzo Casaccia, Qualcomm Standards
- Dr PSM Tripathi, Wireless Planning and Coordination, Department of Telecommunications
- Dr. Ulrich Dropmann, Nokia Standards
- Mr. Dhivagar Baskaran, CEWiT
- Mr. Jishnu A., Tejas Networks
- Prof. Sudhir Dixit, IEEE Future Networks, Basic Internet Foundation & WWRF, USA



Discussion Highlights:

The session underscored that **spectrum is the lifeline of telecom networks**, and achieving harmonization is crucial to realizing the full potential of 6G. While some geographies have a clear roadmap toward 6G deployment, others are still evolving their strategies. Sub-6 GHz spectrum is emerging as a prominent band for 6G globally. India, currently the second-highest data traffic market in the world, is expected to become the largest when 6G services roll out. This presents a unique opportunity for India to **lead Region 3 harmonization** efforts,

particularly in the 7/8 GHz band. Discussions also emphasized the importance of aligning spectrum planning with the **four key requirements of 6G** coverage, capacity, connectivity, and cost.

Speakers outlined the **key drivers of spectrum demand**, including growing capacity requirements, evolving technical needs, and the rapid adoption of digital technologies by a larger base of users and applications. Reference was made to ITU-R M.2160, which identifies frequency bands for IMT-2030 and beyond, spanning low bands (<1 GHz), mid bands, and high bands. New frequency bands identified under WRC-27 Agenda Item 1.7 will be essential to meet future connectivity requirements. The panel highlighted that **global spectrum harmonization** will bring multiple benefits affordability, seamless international roaming, broader consumer choice, economies of scale for billions of subscribers, sustainability, and more efficient cross-border spectrum coordination.

The discussion also explored the **potential of THz bands** for 6G, emphasizing their unique characteristics such as large bandwidths, specular propagation components, and the use of large aperture antenna arrays. However, significant challenges remain in system design and development to ensure seamless connectivity and interoperability across different frequency bands. Maintaining mobility across various radio systems in low, mid, and high bands will require robust handover mechanisms and careful architectural planning. Integration of terrestrial networks with NTN and their respective spectrum allocations will further add to the complexity.

Finally, the session addressed **technology and commercialization challenges**, including issues related to microelectronics, packaging for THz systems, and ensuring commercial viability at scale. The panel concluded that harmonizing spectrum and standards at the global level is not just a technical necessity but a strategic imperative to ensure that 6G networks deliver on their promise of universal, affordable, and sustainable connectivity.

Fireside Chat: Semiconductor Advancements for 6G Readiness

Moderator:

- Mr. Rajesh Kumar Pathak DG Bharat 6G Alliance

Session Speakers:

- Dr. Naveen Yanduru, Axiro Semiconductor
- Mr. Akshay Aggarwal, MediaTek
- Mr. Udayan Mukherjee, Intel

Discussion Highlights:

The fireside chat focused on the critical role of semiconductors in enabling India's 6G ambitions, highlighting policy initiatives, technological evolution, and monetization opportunities. Speakers underscored the Government of India's Semicon India Programme, which aims to make the country a global hub for electronics manufacturing through fiscal

support of nearly USD 30 billion. This includes USD 10 billion for semiconductors and display ecosystems, USD 9.7 billion for electronics manufacturing, and USD 13 billion for allied sectors, with 50% pari-passu incentives for semiconductor projects. Under this programme, several major companies—including Tata, PSMC, Micron, Renesas, Kaynes, and SiCSem have received approvals, signaling strong momentum in building a trusted and advanced semiconductor ecosystem.



The discussion highlighted that semiconductors form the foundation of 6G, enabling advancements across RF frontends, intelligent baseband processing, and network–device integration. 6G networks will involve hyper-local integration of communication and compute, where devices collaborate at lower power levels to support intelligent, ambient computing environments. While 5G introduced Multi-access Edge Computing (MEC), in 6G devices will be even closer to the network, with baseband processors integrating AI chips to determine optimal functions. This evolution will support pervasive 6G architectures, enabling seamless terrestrial and non-terrestrial (TN–NTN) integration and driving new use cases such as fixed wireless access (FWA) through optimized chipsets.

Speakers emphasized the rising cost and complexity of chip design, noting that each new technology node demands significant investment. Designing power-efficient chips is both crucial and increasingly expensive. To address this, the radio access network (RAN) is expected to transition to power-efficient merchant silicon, supported by advances in general-purpose architectures with integrated acceleration and advanced packaging. For instance, Intel’s silicon platform is working toward a unified compute platform for RAN with AI capabilities, demonstrating how infrastructure silicon is evolving to meet the demands of 6G. Key design

metrics such as power, performance, and area (PPA) will remain central, as baseband processors become more intelligent and incorporate increasing MIMO functionality.

On the infrastructure and architectural front, panellists discussed the need for scalable, AI-native silicon across all network layers, with cloud RAN playing a central role. Strategic choices by silicon vendors regarding investments and architectural directions will shape future 6G deployments. The evolution of silicon will enable intelligent, power-efficient, and software-driven networks, which are essential for supporting emerging 6G use cases.

The chat also explored monetization avenues for 6G, identifying sensing and communication as a potential “killer application.” As networks become more ambient and data-intensive, embedding compute capabilities across all layers—from mobile devices to the packet core—will create new opportunities. Integrated Sensing and Communication (ISAC) was highlighted, with use cases spanning unmanned vehicles, drones, and beyond. Panellists emphasized that India, as a major market, can play a pivotal role in shaping global 6G standards through consolidated engagement in 3GPP and other forums. While the AI layer is still in its early stages, its full potential in silicon and network transformation is yet to be fully realized.

Session 7: Roundtable – Global Cooperation in driving unified 6G roadmap

(Objective: Bridging alliances across continents for a common 6G vision)

Moderator:

- Dr. Kumar Sivarajan, Vice-chairman, Bharat 6G Alliance and Tejas Networks

Session Speakers:

- Dr. Amitava Ghosh, NextG Alliance, USA
- Prof. Harald Haas, Future Telecoms, UK
- Prof. Rahim Tafazolli, University of Surrey, UK
- Dr. Anita Doehler, NGMN Alliance
- Dr. Colin Willcock, 6G-IA, Europe
- Mr. Afif Osseiran, 5G-ACIA
- Prof. Gerard Parr, UK-India Future Networks Initiative (UKI-FNI)- UK
- Prof. KyungHi Chang, 6G Forum, South Korea (Video Message)
- Prof. Akihiro Nakao, XG Mobile Promotion Forum (XGMF), Japan (Video Message)



Discussion Highlights:

The roundtable brought together senior representatives from 6G alliances around the world to deliberate on how international alliances can collectively shape a unified global 6G roadmap. The discussions underscored that while different regions have distinct technology priorities and deployment contexts, global cooperation is essential to ensure interoperability, scale, and inclusivity. Participants explored how partnerships can pool resources, align policy frameworks, and accelerate the rollout of interoperable 6G systems through coordinated efforts.

Speakers emphasized that technology priorities differ across geographies, and understanding these differences is critical to designing a global framework. For example, the NextG Alliance in the US has identified nine key use cases, with particular emphasis on LPWAN (Low Power Wide Area Networks) and Fixed Wireless Access (FWA) as foundational drivers. Verticals such as agriculture, public safety, and other wide-area applications are also expected to play a major role in shaping the US 6G landscape. Similarly, discussions pointed to the need for training datasets and AI models that can adapt across regions—raising questions such as whether AI models developed in the UK would perform effectively in the Indian environment. This highlighted the importance of regional context in data, use cases, and network design.

The panel identified three major areas of convergence essential for a meaningful technological framework: AI integration, embedding sensing capabilities into networks, and building resilience through fiber and infrastructure upgrades. Participants agreed that these elements must form the backbone of a globally harmonized 6G ecosystem. There was a strong consensus on the importance of a single global standard, ensuring interoperability, reducing fragmentation, and driving affordability and scale for billions of users worldwide.

The discussions also reaffirmed that no single country can define 6G in isolation, and multi-stakeholder global cooperation is the only viable path forward. The Bharat 6G Alliance was recognized as a key convening platform to anchor India's leadership role. India's unique position as a bridge between advanced economies and emerging markets enables it to bring diverse stakeholders together and foster an inclusive, globally harmonized 6G roadmap.

Valedictory Session and Way Forward

(Objective: Closing reflections and actionable roadmaps from global leaders on research, policy, and partnerships to deliver a trusted, inclusive, and scalable 6G future)

- Shri Anil Kumar Bhardwaj, DDG SE, Department of Telecommunications,
- Dr. Mallik Tatipamula, Chief Technology Officer, Ericsson Silicon Valley, USA
- Dr. Ulrich Dropmann, Head of Standardization and Industry Environment, Nokia
- Prof. David Koilpillai, Chairman, Bharat 6G Alliance and Professor, IIT Madras
- Mr. Rajesh Kumar Pathak, Bharat 6G Alliance

Discussion Highlights:

The valedictory session brought together an international panel of experts who delivered closing reflections on the symposium's deliberations. A unanimous consensus emerged on the critical importance of global cooperation to prevent fragmentation of standards and ensure a unified approach to 6G. Speakers emphasized the need for a single global roadmap that integrates research priorities, academic-industry collaboration, spectrum policy frameworks, governance mechanisms for secure and trusted networks, and joint testbed development with cross-border pilots.

Participants pointed to ongoing bilateral and multilateral initiatives including the US-India VINES program, the UK-India 6G Joint Statement, and EU-Japan collaborations—as effective models for coordinated international action. These initiatives demonstrate how shared goals, funding mechanisms, and technical exchanges can accelerate the global 6G agenda.

Key outcomes included a shared commitment to maintaining an open architecture ecosystem through joint standardization, and an agreement on the importance of public-private funding to support international testbeds and pilot projects. India's role as a bridge between developed and developing nations was reaffirmed, with the Bharat 6G Alliance recognized as the central anchor for international cooperation in the 6G domain.

Outlook

The International Bharat 6G Symposium 2025 marked a significant evolution from the conceptual dialogues of 2024 to structured collaborations and policy alignments in 2025. A landmark joint statement titled *“Endorsing Principles for 6G: Secure, Open, Resilient, Inclusive, and Sustainable by Design”*, co-signed by Bharat 6G, 6G IA, ATIS' Next G Alliance, XGMF, 6G Forum, 6G Brazil, UKI-FNI, UK TIN, UK Federated Telecoms Hubs – CHEDDAR, HASC, JOINER and TITAN, and 6G Flagship, reaffirming a unified global vision

for inclusive and secure 6G development. NGMN Alliance choose Joint bilateral declaration with Bharat 6G Alliance. The alliance leaders proposed to take it forward among themselves vertical level engagements in coming out with Whitepapers, Workshops and Joint reports.

The symposium showcased India's transformation into a driving force of global 6G cooperation, blending visionary research with pragmatic policy frameworks. India was repeatedly acknowledged as a connector between advanced research economies and emerging markets, ensuring that the global 6G roadmap remains inclusive, sustainable, and harmonized. The discussions and outcomes from this symposium set a strong foundation for long-term, structured international partnerships that will shape the future of 6G.



Acknowledgement

Bharat 6G Alliance expresses sincere gratitude to the Department of Telecommunications (DoT), Government of India, for their guidance and support. India Mobile Congress 2025 organisers for providing this platform. We would like to thank our supporting organisations COAI, TCOE India, TEPC, TSDSI and VOICE. We are also grateful to our foreign supporters ATIS' NextG Alliance, 6G-IA, 6G Flagship, 6G Forum, XGMF, 5G ACIA, NGMN Alliance, UKI-FNI, UK TIN, Federated Telecom Hub UK, 6G Brasil, IEEE Future Networks, Royal Academy of Engineering, The Canadian Academy of Engineering for providing their logo support and also their participation.

We thank our sponsors- NOKIA and GSMA and the India Mobile Congress (IMC) team for their collaboration in making the symposium a global success.

Special appreciation is extended to the Bharat 6G Alliance (B6GA) Secretariat for their dedication and seamless coordination. Their collective efforts ensured the success of this landmark event showcasing India's leadership in 6G innovation and international cooperation.

10/22/25, 12:15 PM

Press Release: Press Information Bureau

Ministry of Communications



Prime Minister Shri Narendra Modi addresses the India Mobile Congress 2025

India Mobile Congress and the country's success in the telecom sector reflect the strength of the Aatmanirbhar Bharat vision: PM

Union Minister Shri Jyotiraditya Scindia inaugurates International 6G Symposium 2025 at IMC 2025

"India is no longer a mere consumer of technology. We strive to be the architects of the future of technology": Union Minister Scindia

Bharat 6G alliance signs 2 MoU with NASSCOM and European Space Agency for fostering joint participation in the field of technology development

Bharat 6G Alliance also releases 4 whitepapers titled "Spectrum Roadmap for 6G in India" and "Powering Next-Gen Telecom", "AI and Network evolution to 5G", "6G Architecture, Security and Exposure Framework for RF Sensing"

IMC 2025 Exhibition inaugurated- over 400 participants displaying cutting-edge innovations

Posted On: 08 OCT 2025 3:08PM by PIB Delhi



Prime Minister Narendra Modi today inaugurated the 9th edition of the India Mobile Congress (IMC) 2025, Asia's largest telecom, media, and technology event, in New Delhi. In his address, he praised India's technological growth, highlighting key innovations by startups in areas like quantum communication, 6G, and financial fraud prevention. The Prime Minister acknowledged that the government's support through initiatives such as the Telecom Technology Development Fund has been crucial in driving this progress. He also pointed out that India's success in the telecom sector, exemplified by its six fold growth in electronics production and 28-fold increase in mobile manufacturing since 2014, reflects the strength of the Aatmanirbhar Bharat vision. He emphasized the significance of India's Made-in-India 4G stack, marking the nation's technological self-reliance and its export readiness, contributing to the 'India 6G Vision 2030'.

The Prime Minister also highlighted the recent enactment of the Telecommunications Act, which facilitates faster approvals and network expansion. He underscored the government's focus on cyber security, with stronger laws against cyber fraud and enhanced grievance redressal mechanisms benefiting both industries and consumers. Recognizing the collaborative efforts needed between startups, academia,

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=2176270&s=08>

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In his inaugural address, the Union Minister of Communications highlighted the importance of fostering international cooperation, advancing indigenous R&D, and leveraging India's digital capabilities to shape the global 6G landscape. He repeated his 6G mantra for the successful implementation of 6G ecosystem in India. *"India is no longer a mere consumer of technology. We strive to be the architects of the future of technology"*, Minister Scindia said, and added, *"India is here not to follow, but to co-lead the 6G revolution."* He extensively laid importance to swadeshi telecom ecosystems such as recent launch of swadeshi 4G network with 1 lakh towers, allowing India to develop a future ready framework which can support next generation network. He also laid emphasis on global collaboration across governments, academia and organizations for 6G and make it affordable for everyone.

The International 6G Symposium is a key highlight of IMC 2025, reinforcing India's commitment to building a **secure, inclusive, and future-ready telecom ecosystem**, while positioning the country as a global leader in 6G technology development and deployment.

IMC 2025 Exhibitor Hall



<https://www.pib.gov.in/PressReleasePage.aspx?PRID=2176270&s=08>

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10/22/25, 12:15 PM

Press Release: Press Information Bureau

and policymakers, Shri Modi expressed hope that platforms like IMC would foster such dialogue to further the nation's technological advancements.



Speaking on the occasion, Union Communications Minister Jyotiraditya Scindia highlighted India's transformation from a technology consumer to a global digital leader. He outlined the country's 6G ambitions, which are expected to contribute \$1.2 trillion to India's GDP by 2035. Scindia also noted India's goal of securing 10% of global 6G patents and its growing satellite communications market, projected to triple by 2033. He praised the success of the Production-Linked Incentive scheme, which has driven significant growth in production, exports, and job creation. Additionally, Scindia emphasized India's digital revolution, marked by a 98% drop in mobile data costs and the global recognition of its digital public infrastructure. He also celebrated the thriving startup ecosystem, with the Startup World Cup 2025 showcasing India's innovative spirit.

International 6G Symposium 2025

Later, Union Minister Jyotiraditya Scindia and Dr. Neeraj Mittal, Secretary (Telecom), inaugurated the International 6G Symposium 2025 at the India Mobile Congress (IMC) 2025, being held at Yashobhoomi, New Delhi.

The symposium brought together global thought leaders, policymakers, industry experts, and academia to deliberate on **next-generation 6G technologies**, research collaborations, standardisation efforts, and pathways for India to lead the 6G innovation ecosystem.

In the symposium, Bharat 6G alliance signed 2 MoU with NASSCOM and European Space Agency for fostering joint participation in the field of technology development. Bharat 6G Alliance also released 4 whitepapers titled "Spectrum Roadmap for 6G in India" and "Powering Next-Gen Telecom", "AI and Network evolution to 5G", "6G Architecture, Security and Exposure Framework for RF Sensing.

A joint declaration endorsing principles for 6G was also showcased which will be released on October 10, 2025.

10/22/25, 10:12 AM

Press Release: Press Information Bureau

Ministry of Communications



Leading 6G Alliances and Research Institutions issue a Joint Statement reaffirming a shared commitment to shape the future of 6G as a global public good

Commitment to Shape the Next Generation of Wireless Communication as Secure, Open, Resilient, Inclusive, and Sustainable by Design

The New Delhi Declaration establishes 6G as a shared global endeavour, built on collaboration, transparency, and mutual trust

Partners committed to ensuring that 6G evolves as a global public good—empowering every nation, enterprise, and citizen through accessible and affordable connectivity

Posted On: 11 OCT 2025 5:01PM by PIB Delhi

At the International Bharat6G Symposium 2025, held alongside India Mobile Congress 2025, leading global research alliances "Bharat 6G, 6G Smart Networks and Services Industry Association (6G-IA), ATIS' Next G Alliance, XGMF, 6G Forum, 6G Brazil, UKI-FNI, UK TIN, UK Federated Telecoms Hubs (CHEDDAR, HASC, JOINER & TITAN), and 6G Flagship " came together to issue a Joint Statement reaffirming a shared commitment to shape the future of 6G as a global public good.



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Press Release: Press Information Bureau

Together, they endorsed the guiding principles for 6G by Design ensuring that the next generation of connectivity is:

- ◆ Trusted and Secure
- ◆ Resilient and Reliable
- ◆ Open and Interoperable
- ◆ Inclusive and Affordable
- ◆ Sustainable and Globally Connected

The declaration underscores the need for *trustworthy-by-design* networks. It highlighted trusted ecosystems, risk mitigation, and AI-native safeguards across the telecom lifecycle.

Resilience engineering, fail-safe design, and privacy-preserving architectures will be central to ensuring always-on connectivity for billions of devices and users worldwide.

Recognising that 6G must be developed as a global public good, the declaration calls for open, transparent, and inclusive standardisation.

The joint statement promotes open interfaces, multi-vendor interoperability, and AI-enabled Network orchestration to accelerate innovation and affordability.

The declaration places sustainability at the heart of 6G design calling for energy-efficient, repairable, and recyclable systems that reduce carbon footprints while ensuring affordability and accessibility.

It envisions end-to-end global coverage through the integration of terrestrial and non-terrestrial networks satellites, high-altitude platforms, and future space-based systems — to deliver seamless connectivity across land, sea, air, and space.

Acknowledging the need to prepare the next generation for a rapidly evolving telecom landscape, the declaration emphasizes **skills development** and **capacity building**.

Partner alliances committed to advancing talent pipelines across hardware, software, and network standards to design, deploy, and secure future 6G and integrated terrestrial–non-terrestrial systems.

In closing, the participating organisations - Bharat 6G, 6G-IA, ATIS' Next G Alliance, XGMF, 6G Forum, UK TIN, UK Federated Telecoms Hubs, 6G Flagship, 6G Brazil, and UKI-FNI called upon governments, industry, academia, and civil society to align around these shared principles.

“By anchoring 6G in security, openness, resilience, inclusivity, affordability, sustainability, and trust, we commit to shaping a network fabric that uplifts societies, accelerates digital economies, and ensures no one is left behind”, the Declaration stated.

At the International Bharat6G Symposium 2025 in New Delhi, this joint declaration marks a milestone: a unified global step toward making 6G a truly universal, trustworthy, and inclusive intelligent network.

International Bharat6G Symposium 2025

OCTOBER 9–10, 2025 | YASHOBHOOMI CONVENTION CENTRE, NEW DELHI, INDIA

New Delhi Declaration

Joint Statement Endorsing Principles for 6G: Secure, Open, Resilient, Inclusive, and Sustainable by Design

Bharat 6G, 6G Smart Networks and Services Industry Association (6G-IA), ATIS' Next G Alliance, XGMF, 6G Forum, 6G Brazil, UKI-FNI, UK TIN, UK Federated Telecoms Hubs (CHEDDAR, HASC, JOINER and TITAN), and 6G Flagship

New Delhi: 10th October 2025

At the International Bharat6G Conference 2025 (9-10 October 2025), held at the sidelines of the India Mobile Congress (IMC) 2025, research alliances from partner countries affirm our commitment to shaping the future of 6G wireless communication systems as a shared global endeavour. Together, we recognize that 6G will serve as the connective fabric of the future digital economy, enabling intelligent networks and services, automation, and inclusion across all sectors of society.

By working together, we can ensure that 6G is secure, open, resilient, inclusive, affordable, and sustainable—a global public good that empowers every nation and citizen. Collaboration is essential to addressing pressing challenges and maximizing the opportunities available to the world for achieving our socio-economic and environmental goals.

We therefore declare our shared intention to align research, development, standardization, and deployment around the following principles for 6G by design:

1. Trusted and Secure Technology

6G networks must be secure and trustworthy-by-design, ensuring resilience across hardware, software, and supply chains.

Trusted ecosystems should safeguard national security and public safety, while protecting civil liberties and individual rights.

Risk mitigation must address growing complexity, critical infrastructure dependence, and the rise of AI-native functions in telecom systems, with safeguards for data protection, transparency, and accountability across their lifecycle.

2. Resilience, Reliability, and Privacy

6G must deliver always-on availability with rapid recovery mechanisms, fail-safe design, and proactive resilience engineering to maintain services.

Privacy-preserving architectures, cryptography, and responsible use of AI are essential to protect individuals, business and institutions.

Networks must incorporate resilience at scale, handling billions of connected devices, agents, and workloads in real-time without compromising safety

3. Global, Transparent, and Inclusive Standardization

Standards must be developed in open, transparent, impartial, and consensus-driven forums with equitable participation across nations, regions, and stakeholder groups.

Technical specifications must promote interoperability, resilience, openness, and competition, and respect intellectual property rights while driving accessibility and innovation. Ensuring resilience, open participation by multiple providers and stakeholders is essential. Active collaboration is encouraged between international standards bodies (e.g., 3GPP, ITU, IEEE, O-RAN Alliance) and innovation alliances (Bharat 6G, 6G-IA, ATIS' Next G Alliance, XGMF, 6G Forum, 6G Brazil, The EPSRC UK-India Future Networks Initiative- UKI-FNI, UK Federated Telecoms Hubs (CHEDDAR, HASC, JOINER and TITAN), UK TIN and 6G Flagship) while maintaining a transparent, inclusive, and trustworthy 6G standards process.

4. Open and Interoperable Innovation

6G must embrace open interfaces and multi-vendor interoperability across Terrestrial and Non-Terrestrial hardware, software, and cloud-native platforms.

6G should support AI-enabled Radio Access Networks, software-defined networking, AI-native orchestration, and virtualization as catalysts of innovation and flexibility.

International collaboration on R&D, testbeds, and pilot deployments will accelerate breakthroughs in performance, security, and affordability.

5. Support for Commercial Use-Cases and Forward-Looking Business Models

6G must deliver superior commercial value by addressing valuable use-cases in an efficient and cost-effective manner. 6G should also reduce capital and operating costs compared to previous generations.

6G should improve the delivery of use-cases already supported in 5G and also support sustainable and forward-looking business models by adding use cases that enhance the value of mobile networks to the broader economy.

6. Affordability, Sustainability, and Global Connectivity

6G deployments must be energy-efficient, repairable, and recyclable, advancing environmental goals and reducing carbon footprint.

Solutions must remain affordable and accessible, leveraging economies of scale and innovative financing models to support social sustainability.

6G must bridge digital divides, delivering reliable and affordable coverage and consistent user experience across urban, rural, and remote regions.

Networks must empower industries to reduce emissions and enable green digital transformation across sectors such as energy, manufacturing, health, utilities, agriculture, and transportation.

7. End-to-End Global Coverage: Terrestrial and Non-Terrestrial Integration

6G must provide seamless, ubiquitous connectivity across land, sea, air, and space, delivering near-universal global coverage.

Integration of terrestrial infrastructure with satellites, High-Altitude Platforms (HAPS), UAVs, sub-sea and future space-based systems will ensure resilient, universal access.

The goal is a ubiquitous Internet fabric that delivers a consistent experience from a farmer in a remote village to an airplane in flight to astronauts in orbit.

8. Spectrum, Compute, and Supply Chain Diversity

6G must use spectrum efficiently, incorporating dynamic sharing, spectrum aggregation, and AI-optimized allocation to serve diverse use cases.

Networks must scale across the compute continuum from cloud to edge to device leveraging accelerators, GPUs, NPUs, TPUs and future quantum/neuromorphic systems.

Open and resilient supply chains, with multiple providers, are critical to a secure and competitive 6G ecosystem.

9. Skills Pipeline Development

The opportunities to highlight the Telecoms sector as a pathway for excellent employment prospects will be promoted.

Understanding the future needs of the industry that will develop Future Networks will be central to develop the key skills in hardware, software and standards that will be needed to design, deploy, manage and secure the future of 6G and Terrestrial and Non-Terrestrial Integration.

Call to Action

We, Bharat 6G, 6G-IA, ATIS' Next G Alliance, XGMF, 6G Forum, UK TIN, UK Federated Telecoms Hubs (CHEDDAR, HASC, JOINER and TITAN), 6G Flagship, 6G Brazil, The EPSRC UK-India Future Networks Initiative- UKI-FNI call on all research alliances, industries, research institutions, and civil society stakeholders to join us in advancing these shared principles.

By anchoring 6G in security, openness, resilience, inclusivity, affordability, sustainability, and trust, we commit to shaping a network fabric that uplifts societies, accelerates digital economies, and ensures no one is left behind.

At the International Bharat6G Symposium 2025 in New Delhi, **this joint declaration marks** a milestone: a unified global step toward making 6G a truly universal, trustworthy, and inclusive intelligent network.

Bharat 6G Alliance, 9 global bodies sign Delhi Declaration to endorse 6G ecosystem

NEW DELHI: (Oct 11) Government-backed Bharat 6G Alliance along with nine international bodies have signed the Delhi Declaration, which endorses principles for 6G ecosystem including the commitment to make it secure, open, resilient, inclusive, and sustainable by design.

The Delhi Declaration was announced at the International Bharat 6G Symposium 2025 held at India Mobile Congress 2025.

"As 6G research accelerates worldwide, this declaration underscores our collective responsibility to develop trusted technologies, open standards, and sustainable networks. India's leadership through Bharat 6G Alliance reflects our vision for an inclusive digital future. The Bharat 6G Alliance is proud to stand with global 6G alliances in endorsing these shared principles," Bharat 6G Alliance Director General R K Pathak said.

New Delhi declaration – Global 6G Alliances commit to secure, open networks

October 13, 2025

Global 6G alliances, including Bharat 6G, 6G-IA, Next G Alliance, XGMF, 6G Forum, 6G Brazil, UKI-FNI, UK TIN, UK Federated Telecoms Hubs, and 6G Flagship, issued the New Delhi Declaration at the International Bharat6G Symposium 2025, reaffirming a joint vision to make 6G a global public good shaped by collaboration, transparency, and trust.

The declaration emphasizes core principles for '6G by Design', ensuring next-generation wireless systems are secure, open, resilient, and sustainable, with affordable, inclusive connectivity for all nations and communities. Key commitments include trustworthy-by-design networks with robust risk mitigation, native AI safeguards, and privacy-preserving architectures, alongside fail-safe resilience engineering and global coverage through integrated terrestrial and satellite networks.

ETV Bharat / Technology
Nokia's Ulrich Drophmann Emphasises AI, Spectrum, And Global Standards In India's 6G Drive

Nokia's Ulrich Drophmann says India's 6G rollout must balance spectrum expansion, AI-driven networks, and global standards to ensure seamless, future-ready connectivity.

THE TIMES OF INDIA

6G push: Bharat 6G Alliance joins 9 global bodies to sign Delhi Declaration; promotes secure and inclusive ecosystem

TIMESOFINDIA.COM | Oct 11, 2025, 06:53 PM IST



Government-backed Bharat 6G Alliance, along with nine international organisations, has signed the Delhi Declaration, endorsing principles for the 6G ecosystem that include making it secure, open, resilient, inclusive, and sustainable by design. The announcement was made at the International Bharat 6G Symposium 2025, held during India Mobile Congress 2025. "As 6G research accelerates worldwide, this declaration underscores our collective responsibility to develop trusted technologies, open standards, and sustainable networks. India's leadership through Bharat 6G Alliance reflects our vision for an inclusive digital future. The Bharat 6G Alliance is proud to stand with global 6G alliances in endorsing these shared principles," said Bharat 6G Alliance Director General R K Pathak, PTI quoted.

The Delhi Declaration includes the NextG Alliance, 6G Smart Networks and Services Industry Association, Finland's 6G Flagship of Oulu University, South Korea-based 6G Forum, 6G Brasil, Next Generation Mobile Networks Alliance (NGMN), Germany's 5G Alliance for Connected Industries and Automation (5G-ACIA), UK India Future Networks Initiative (UKI-FNI), UK Telecommunications Innovation Network (UKTIN), Japan's XG Mobile Promotion Forum, ESA Europe, and India's TSDSI and Nasscom. An official statement said, "Global research alliances Bharat 6G, 6G Smart Networks and Services Industry Association (6G-IA), ATIS' Next G Alliance, XGMF, 6G Forum, 6G Brazil, UKI-FNI, UK TIN, UK Federated Telecoms Hubs (CHEDDAR, HASC, JOINER & TITAN), and 6G Flagship came together to issue a joint statement reaffirming a shared commitment to shape the future of 6G as a global public good."

ESA and the Bharat 6G Alliance collaborate to develop next-generation satellite-enabled 6G networks

भारत 6जी गठबंधन, नौ वैश्विक निकायों ने दिल्ली घोषणापत्र पर हस्ताक्षर किए

NBS | 11 OCTOBER 2025

नयी दिल्ली, 11 अक्टूबर (भाषा) सरकार समर्थित भारत 6जी गठबंधन ने नौ अंतरराष्ट्रीय निकायों के साथ मिलकर दिल्ली घोषणापत्र पर हस्ताक्षर किए हैं, जो 6जी पारिस्थितिकी तंत्र के सिद्धांतों का समर्थन करता है। इसमें 6जी प्रौद्योगिकी को सुरक्षित, खुला, लचीला, समावेशी और टिकाऊ बनाने की प्रतिबद्धता जताई गई है।

दिल्ली घोषणापत्र को 'इंडिया मोबाइल कांग्रेस 2025' में आयोजित अंतरराष्ट्रीय भारत 6जी संगोष्ठी 2025 में जारी किया गया।

भारत 6जी गठबंधन के महानिदेशक आर के पाठक ने कहा, "जैसे-जैसे दुनिया भर में 6जी अनुसंधान में तेजी आ रही है, यह घोषणापत्र विश्वसनीय तकनीकों, खुले मानकों और टिकाऊ नेटवर्क विकसित करने की हमारी सामूहिक जिम्मेदारी को रेखांकित करता है। भारत 6जी गठबंधन को इन साझा सिद्धांतों का समर्थन करने में वैश्विक 6जी गठबंधनों के साथ खड़े हो पर गर्व है।"

नेक्स्टजी एलायंस, 6जी स्मार्ट नेटवर्क्स एंड सर्विसेज इंफ्रस्ट्रक्चर एसोसिएशन, फिनलैंड की ओउलू यूनिवर्सिटी का 6जी फ्लैगशिप, दक्षिण कोरिया स्थित 6जी फोरम, 6जी ब्रासिल, नेक्स्ट जेनरेशन मोबाइल नेटवर्क्स एलायंस (एनजीएमएन), जर्मनी स्थित 5जी एलायंस फॉर कनेक्टेड इंडस्ट्रीज एंड ऑटोमेशन (5जी-एसीआईए), यूके इंडिया फ्यूचर नेटवर्क्स इनिशिएटिव (यूकेआई-एफएनआई), यूके टेलीकम्युनिकेशंस इन्ोवेशन नेटवर्क (यूकेटीआईएन), जापान का एक्सजी मोबाइल प्रमोशन फोरम, ईएसए यूरोप और भारत के टीएसडीएसआई तथा नैसकॉम दिल्ली घोषणापत्र का हिस्सा हैं।

Bharat 6G Alliance, nine global bodies sign Delhi Declaration to endorse 6G ecosystem

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The NextG Alliance, 6G Smart Networks and Services Industry Association, Finland's 6G Flagship of Oulu University, South Korea-based 6G Forum, 6G Brasil, Next Generation Mobile Networks Alliance (NGMN), Germany-based 5G Alliance for Connected Industries and Automation (5G-ACIA), UK India Future Networks Initiative (UKI-FNI), UK Telecommunications Innovation Network (UKTIN), Japan's XG Mobile Promotion Forum, ESA Europe and India's TSDSI and Nasscom are part of the Delhi Declaration.







Members

							
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International Bharat6G Symposium 2025

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New Delhi Declaration

Joint Statement Endorsing Principles for 6G: Secure, Open, Resilient, Inclusive, and Sustainable by Design

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Bharat6G
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Bharat 6G Alliance Whitepaper

Spectrum Roadmap for 6G in India

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Bharat 6G Alliance Whitepaper

Powering the Next-Gen Telecom

Towards energy efficiency in 6G Macro and Small cell deployments

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AI and Network Evolution to 5G Advanced and 6G

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