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IMC 10 YEARS 2026

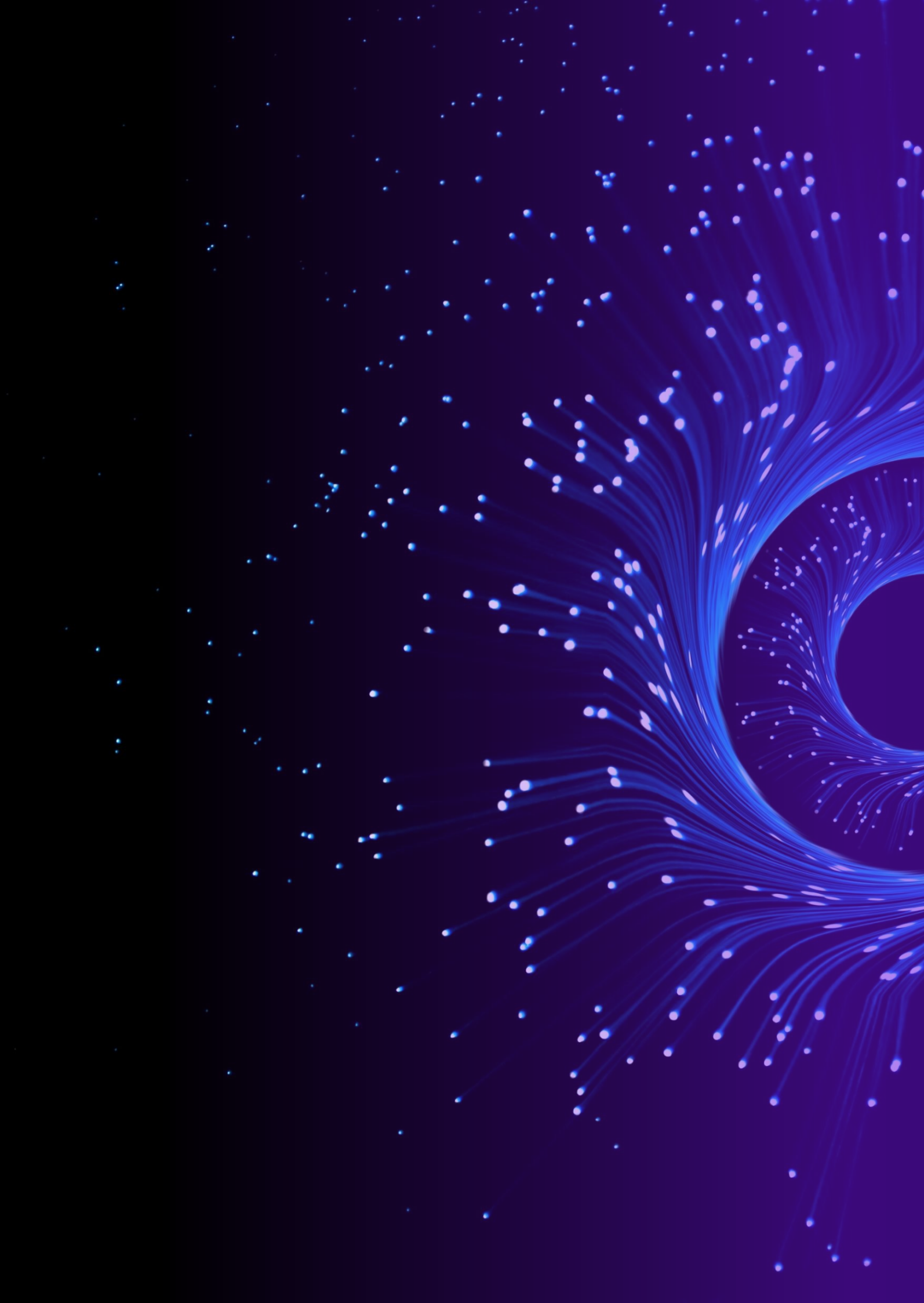
The power beneath connectivity

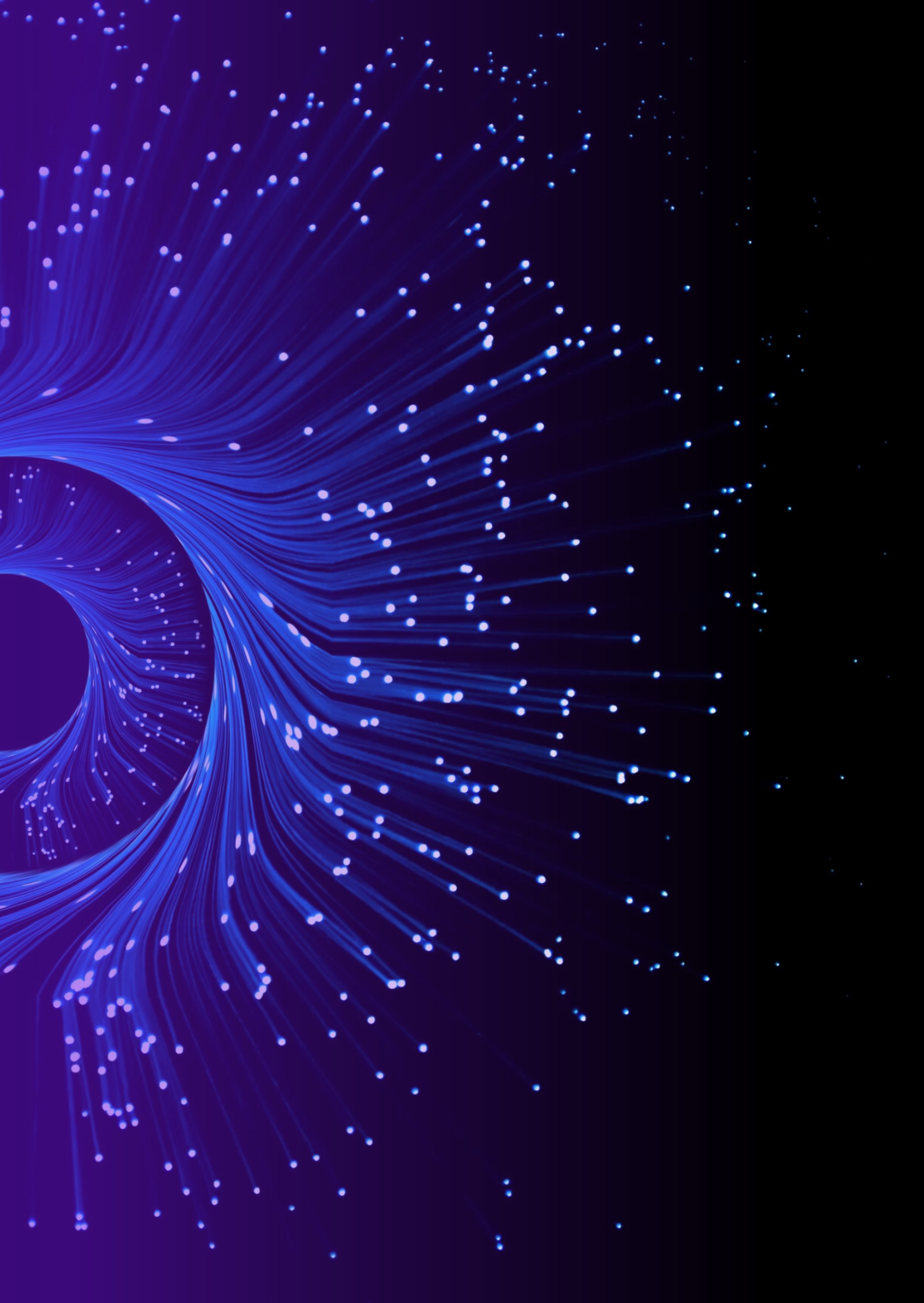
India's path to telecom technology leadership



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Foreword

Ten years ago, India Mobile Congress was established with a clear objective: to create a platform that brought together the telecommunications ecosystem in India. Over the years, both the event and the industry it represents have evolved significantly. What began as a telecom-focused forum has grown into a platform where connectivity, artificial intelligence, cloud, semiconductors, satellite communications, cybersecurity, digital infrastructure and emerging technologies come together to shape the future of the digital economy.

The tenth edition of IMC is therefore more than an anniversary. It reflects how far India's technology ecosystem has progressed over the past decade. The India that hosts IMC today is markedly different from the India that hosted its first edition. The country has moved beyond expanding connectivity and is now exploring how that connectivity can power innovation, economic growth and digital transformation. India has also strengthened its capabilities in indigenous technology development, digital public infrastructure, next-generation networks and advanced manufacturing.

Throughout this journey, IMC has served as a meeting point for policymakers, operators, technology providers, startups, academia, investors and innovators. Its significance extends beyond the technologies on display. Its true value lies in the partnerships, ideas and collaborations that emerge when different parts of the ecosystem come together with a shared vision for the future.

The theme "Scale Without Boundaries" reflects the ambitions of the decade ahead. Scale is no longer measured only by the number of users connected or networks deployed. It is about transforming ideas into products, products into platforms, innovation into industries and Indian capabilities into global opportunities.

This year's edition is built around four pillars: Srishti, representing innovation and creation; Suraksha, strengthening trust and resilience; Sashakt, expanding access and opportunity; and Samvardhan, enabling sustainable growth. Together, these pillars recognise that technology delivers its greatest impact when innovation, trust, inclusion and economic value progress together.

The next phase of digital transformation will be defined by the convergence of AI, intelligent networks, 6G, cloud and edge computing, satellite communications, semiconductors and advanced digital services. It will also require stronger pathways from research to deployment, from innovation to commercialisation, and from domestic success to global competitiveness.

As IMC enters its second decade, its role becomes even more important. It must continue to provide a platform where ideas are exchanged, partnerships are formed and the next generation of technology opportunities takes shape. As we welcome participants from around the world to IMC 2026, our objective is not only to showcase India's progress, but also to help shape the conversations, collaborations and innovations that will define the next decade of growth.



P. Ramakrishna
Chief Executive Officer
India Mobile Congress

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Foreword

India's telecommunications sector has undergone a remarkable transformation over the past decade. What began as a mission to connect millions has evolved into the creation of one of the world's largest and most advanced digital ecosystems. Today, telecom is no longer just about connectivity; it serves as the foundation for digital services, financial inclusion, public platforms, enterprise innovation and emerging technologies that are shaping the future of the economy.

As India Mobile Congress marks its 10th edition, it provides an opportunity not only to reflect on this progress but also to examine the next phase of India's technology journey. The focus is shifting from expanding access to building capability, from adopting technologies to creating them, and from participating in global value chains to strengthening India's role within them. Initiatives such as indigenous telecom technologies, Bharat 6G, the IndiaAI Mission, the Semiconductor Mission, the Telecom PLI Scheme and the Telecom Manufacturing Zone are all part of this broader effort to deepen India's capabilities across the digital and industrial ecosystem.

At the same time, the convergence of artificial intelligence, advanced networks, cloud and edge computing, semiconductors, satellite communications and next-generation digital infrastructure is fundamentally changing the structure of the technology landscape. Networks are becoming intelligent, infrastructure is becoming programmable, and the boundaries between connectivity, compute and applications are increasingly disappearing. This creates a new opportunity for India to leverage its strengths in digital infrastructure, engineering talent, innovation and market scale to build capabilities that are globally relevant and economically significant.

This report examines that opportunity through two interconnected lenses. First, it explores how AI is reshaping the telecom industry, the emergence of intelligent networks, and the capabilities that underpin the Telecom Intelligence Stack. Second, it analyses how India can strengthen its position across the underlying manufacturing and semiconductor value chains, moving beyond assembly towards higher-value activities such as design, components, software, testing and intellectual property creation.

The central message is that India's AI ambitions and telecom ambitions can no longer be viewed separately. The infrastructure required to power intelligent networks is increasingly the same infrastructure required to power the AI economy. Success will therefore depend not only on the technologies India deploys, but also on the capabilities it builds, the ecosystems it nurtures and the position it secures within global value chains.

As IMC enters its second decade under the theme "Scale Without Boundaries," the conversation must move beyond scale alone. The next chapter of India's digital transformation will be defined by how effectively the country converts scale into innovation, capability and global competitiveness. We hope this report contributes to that discussion and helps inform the decisions that will shape India's telecom and technology landscape in the decade ahead.



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Executive summary

The telecom industry is entering a structural transition. Operators are evolving from connectivity providers into digital ecosystem platforms, expanding investments in areas such as cloud, data centres, Artificial Intelligence (AI) infrastructure and software services. This trend is expected to accelerate with AI-native 6G architectures, where intelligence is embedded across network operations and service delivery. As a result, competitive advantage is increasingly linked not only to network infrastructure but also to capabilities in compute, semiconductors, software and AI. For India, this creates a dual opportunity: build more intelligent networks while strengthening domestic capabilities across the technologies and manufacturing ecosystems that support them.

What sets this transition apart is that it is reshaping two industries at once. The networks that carry AI workloads and the factories that build those networks increasingly rely on the same ecosystem of semiconductors, AI accelerators, data centres, optical systems, software and cloud platforms. For India, this means its AI ambitions and its telecom manufacturing ambitions can no longer be pursued separately. Here are some of the key insights from our analysis:

THE SHIFT



~17% vs ~2.7%

Annual mobile network traffic growth vs annual global operator revenue, FY25–30[1][2]

Traffic is racing ahead of revenue.

INDIA'S STRENGTH: SCALE



INR6,270 billion

Handset production in FY26, with INR2,590 billion of exports[13]

33-fold increase in mobile phone production and 165-fold surge in mobile phone exports over the last decade

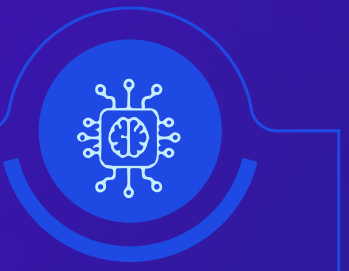
OPPORTUNITY: VALUE CAPTURE



USD25 billion → USD50 billion

India's telecom equipment market growth, FY25-32: nearly twice the global growth rate[20]

Growth creates room for indigenous innovation.



USD720 – 745 billion

Estimated 2026 capex of top four hyperscalers with AI and data-centre infrastructure as primary drivers[3][30][31][32]

AI infrastructure and telecom networks are becoming part of the same industrial ecosystem.



60% import substitution

India has significantly expanded domestic telecom equipment production over the past decade[19]

Domestic production is gaining momentum.



12 approved, 3 in production

Semiconductor projects approved under the India Semiconductor Mission (ISM) 1.0; three are already in commercial production[13]

Chips have moved from paper to production.

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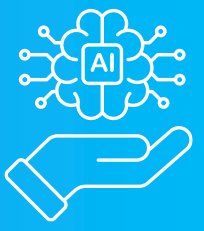
Future competitiveness will depend not only on network ownership, but also on control of strategic capabilities across the telecom intelligence stack. India has demonstrated scale in connectivity, handset production and software-led integration; however, domestic value capture remains constrained in advanced semiconductors, specialised components, optical technologies and selected equipment categories. The strategic priority is therefore to deepen capability in the layers where economic value, resilience and intellectual property converge.

India enters this transition with a manufacturing base that has already proven it can scale. Handset production reached INR6,270 billion in FY26, with exports of INR2,590 billion[13], and telecom production linked incentive (PLI) beneficiaries have generated INR1,011 billion of sales[24]. Import substitution in telecom equipment has reached about 60 per cent[19], 12 semiconductor projects have been approved with three already in commercial production[13], and a total of 106 projects have been approved under the Electronics Component Manufacturing Scheme (ECMS)[36]. The deeper layers tell a different story. Several critical components remain more than 80 per cent import-dependent, and telecom equipment exports of USD0.6–1 billion a year compare with imports of USD4–5 billion[20]. India has demonstrated that it can scale final assembly. The next challenge is value capture.

That challenge is becoming increasingly important as the industry's highest-value opportunities move beyond final assembly and into semiconductors, telecom software, radio systems, optical networks, critical components, testing platforms and AI infrastructure. The question is no longer whether India can manufacture telecom products, but whether it can secure meaningful positions in the layers where future growth, innovation and competitiveness will be determined.

India's industrial, telecom and AI policies are increasingly converging around this objective. PLI scheme, the ECMS, the telecom technology development fund (TTDF), the India Semiconductor Mission and the telecom manufacturing zone (TMZ), collectively support capabilities spanning manufacturing, innovation and ecosystem development. This reflects a broader reality: the AI stack and the telecom manufacturing stack are converging. Intelligent networks, AI infrastructure and digital services increasingly depend on the same underlying ecosystem of chips, hardware, software, data and compute.

India's AI ambitions and its manufacturing ambitions are one strategic bet. AI demand could give domestic manufacturing the scale it needs, and a deeper manufacturing base could give India control over the networks and models its AI future depends on.



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Chapter 01

Telecom's new centre of gravity



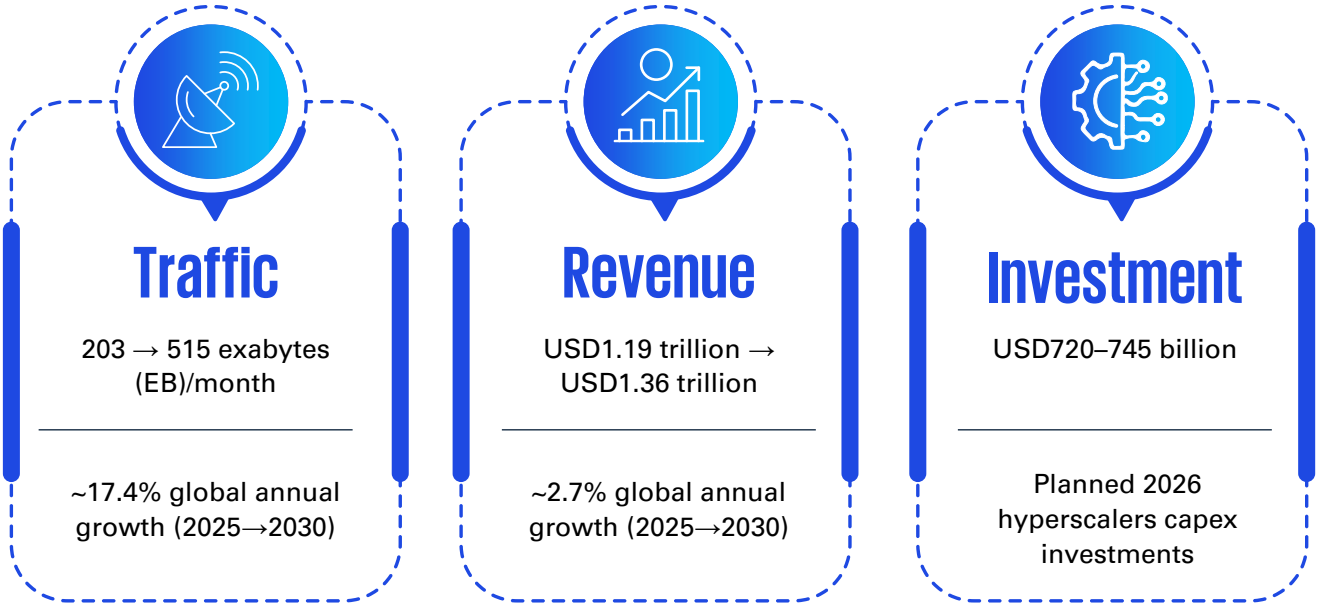
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Telecom's new centre of gravity

AI is rewriting the telecom playbook. For three decades, the industry's growth equation was simple: build coverage, add capacity, sign up subscribers, and revenue follows. That equation is now changing. While AI is creating unprecedented demand for connectivity, an increasing share of the economic value is flowing beyond the network, into semiconductors, data centres, compute infrastructure, AI models and digital platforms. Connectivity remains the foundation of the digital economy, but intelligence is increasingly becoming its centre of gravity. The strategic challenge for telecom is no longer just how to carry more traffic, but how to capture more value from the ecosystem that traffic enables.

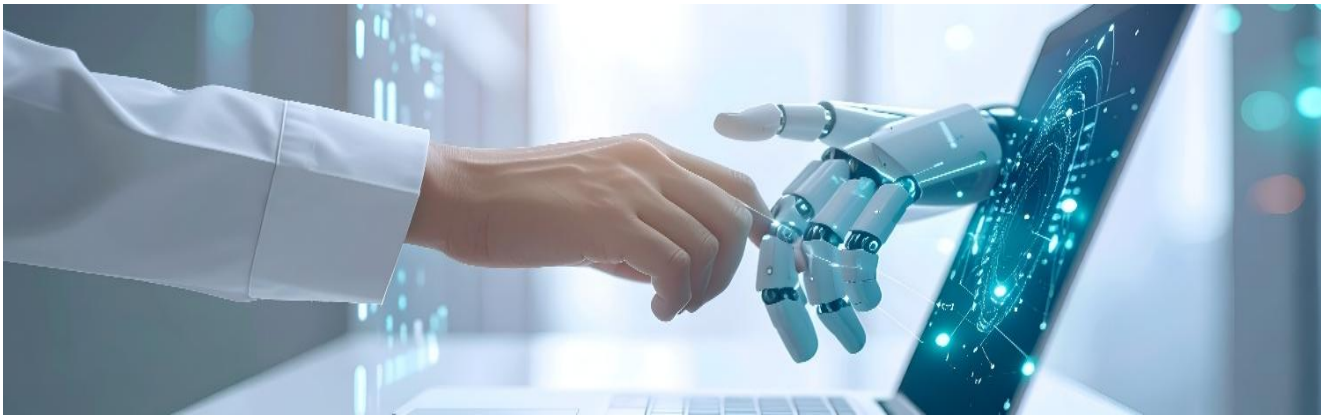
AI is reshaping where value is created and captured

Figure 1.1 Diverging growth and investment indicators



Traffic, revenue and AI investment, 2025–2030, KPMG in India Analysis[1][2][3][30][31][32]

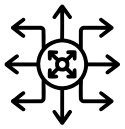
Telecom is becoming an industry of diverging curves. Mobile network traffic is expected to grow by approximately 17 per cent annually[1], nearly six times faster than operator revenues at 2.7 per cent[2]. At the same time, hyperscalers are planning USD720-745 billion of capex in 2026, equivalent to roughly 60 per cent of global mobile operator revenues in 2025. Value is increasingly shifting beyond the network, towards AI infrastructure, semiconductors, cloud platforms, software and digital services. Operators continue to own the infrastructure through which AI reaches consumers, enterprises and machines. The challenge is no longer carrying more traffic, but capturing more value from the ecosystem that traffic enables.



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The redistribution is not abstract. It is visible in where capital is moving, how companies are restructuring and what governments now treat as strategic.

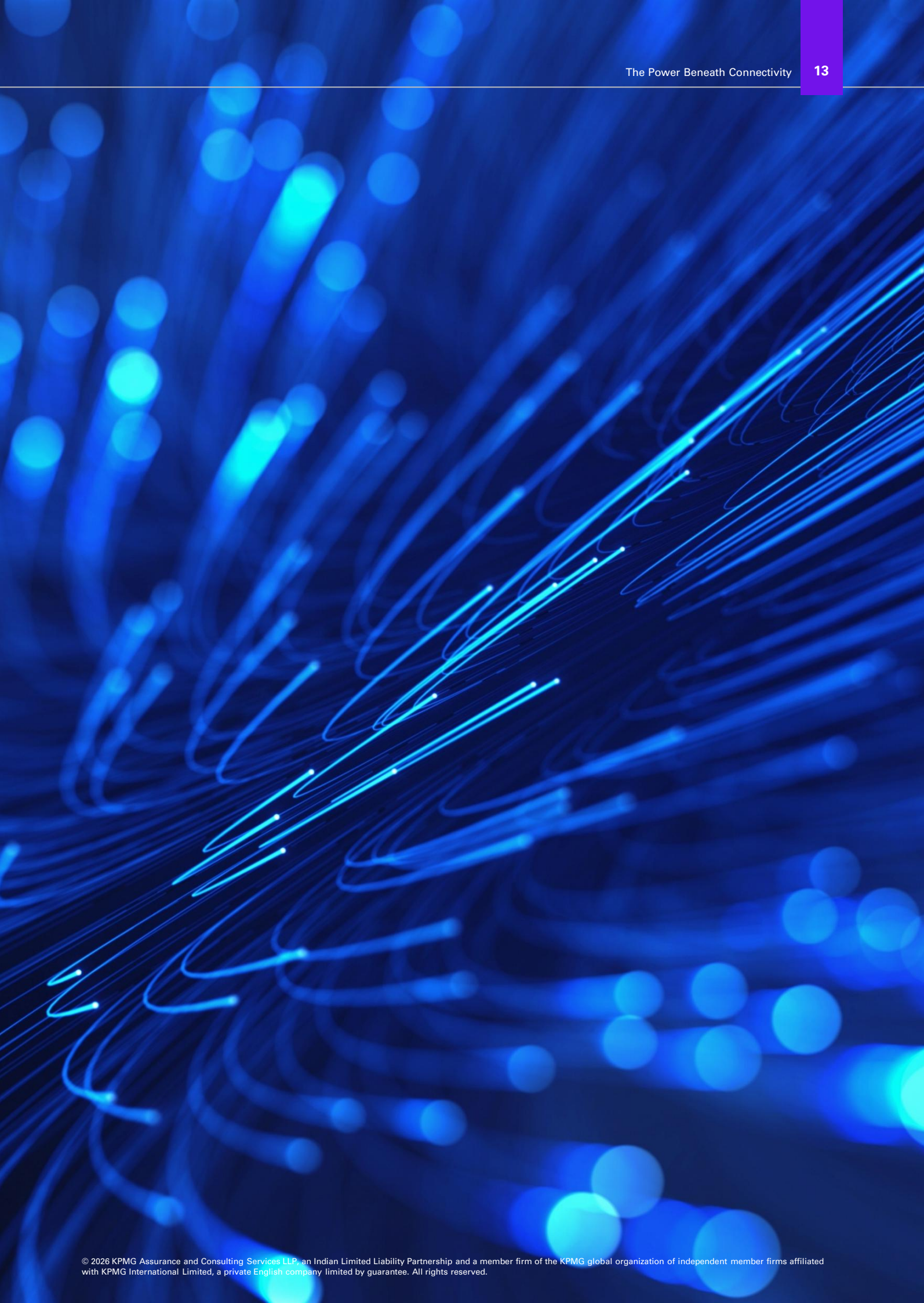
Table 1.1 Four shifts are redrawing the industry's map

Shift	What is changing	Industry examples
 **Value Shift**	AI increases network demand, but more value accrues to software, models and compute platforms.	Alphabet, Meta, Amazon and Microsoft are collectively expected to invest approximately USD720–745 billion of total capex in 2026, with AI and data-centre infrastructure serving as key investment drivers[3][30][31][32].
 **Industry shift**	The integrated telecom model is giving way to infrastructure, platform and services layers.	The rise of tower company (TowerCo), Infrastructure company (InfraCo) and network company (NetCo) structures globally reflects the separation of infrastructure ownership from service delivery. Independent tower companies now operate telecom infrastructure at scale across multiple markets.
 **Architecture shift**	Networks are becoming part of a distributed compute environment.	Verizon signed a fibre agreement worth more than USD1 billion with Google to connect AI data centres, while Lumen reported nearly USD13 billion of AI infrastructure connectivity agreements[34][4]. Fibre, edge locations and transport networks are increasingly becoming inputs into AI infrastructure.
 **Sovereignty shift**	Data, compute and communications are becoming strategic assets.	Deutsche Telekom's Industrial AI Cloud in Munich highlights how sovereign AI infrastructure is becoming a strategic national asset. Similar initiatives are emerging across Europe, Asia and the Middle East as governments seek trusted domestic AI capability[35].

Connectivity, compute and intelligence are becoming increasingly intertwined, creating new control points, new dependencies and new sources of competitive advantage.

These shifts point to a deeper reality: value, control and dependency are not spread evenly across the telecom ecosystem. The next chapter shows where they concentrate.

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Chapter 02

The telecom intelligence stack



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The telecom intelligence stack

The shifts described in the previous chapter point to a deeper reality that value, control and dependency are not distributed evenly across the telecom ecosystem. They increasingly concentrate within specific layers of technology and infrastructure that sit beneath intelligent services.

Understanding the future of telecom therefore requires looking beyond AI applications themselves and examining the capabilities that enable intelligence to operate at scale. The question is no longer just how operators use AI. It is about understanding which capabilities make intelligent networks possible, who controls them, and where new dependencies are beginning to emerge.

To see where value and control are moving, the telecom ecosystem must be decomposed into the capabilities that create and operationalise intelligence. This architecture can be understood through what we call the 'telecom intelligence stack'.

Table 2.1 - Telecom intelligence stack

Telecom intelligence stack

Layer	What it includes	Role in AI-enabled network
Semiconductors	CPUs, GPUs, NPUs, baseband processors, RF and optical chips, memory, semiconductor design tools (EDA), packaging, fabrication and testing	Provides the physical processing and communications capabilities on which the rest of the stack depends
Compute and infrastructure	Servers, AI accelerator clusters, storage, high-performance networking, data centres, edge facilities, power and cooling systems	Determines where AI workloads can run and at what cost, latency and scale
Telecom network	Radio access network (RAN), radios, antennas, baseband, optical transport, routers, core, operations support systems/business support systems (OSS/BSS) and access networks	Provides the communications fabric and increasingly the operating environment in which AI decisions are executed
Data and network knowledge	Telemetry, topology, alarms, performance data, service context, historical operational records and governance	Provides the contextual information from which telecom-specific intelligence can be learned and validated
AI software and orchestration	AI frameworks, runtimes, machine learning operations (MLOps), model serving, data pipelines, analytics and orchestration	Connects models to network systems and determines how intelligence is deployed, updated and controlled
Models and intelligence	Foundation models, telecom-domain models, smaller specialised models, embeddings, retrieval and multimodal models	Convert network data and context into predictions, recommendations and decisions
Autonomy and control	AI agents, closed-loop automation, assurance, optimisation, policy engines, security controls and human oversight.	Moves networks from assisted decision-making towards increasingly autonomous operations
APIs, services and applications	Network application programming interfaces (APIs), programmable connectivity, network as a service (NaaS), enterprise services and vertical applications	Connects network intelligence to customers, developers and wider digital ecosystems

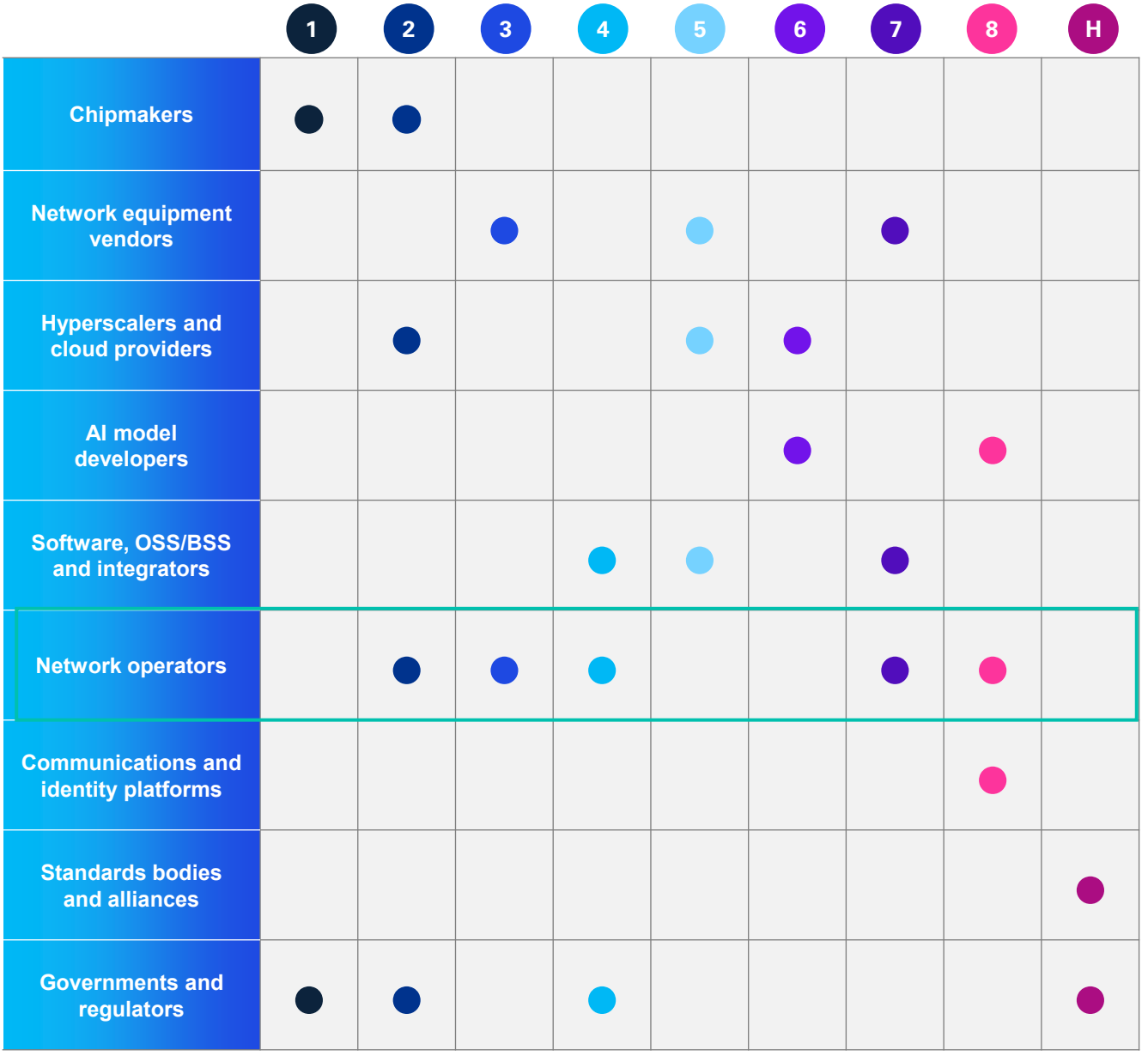
Across all layers, security, identity, governance, interoperability, standards and talent act as horizontal capabilities. They are not an overlay but a prerequisite for trust, resilience and scale.

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The telecom intelligence stack represents an ecosystem of technologies and capabilities that enable intelligence to be created, deployed and operated within telecom networks. It extends well beyond AI models, spanning semiconductors, compute infrastructure, network platforms, data systems, software, intelligent control systems and customer-facing services.

As networks become increasingly intelligent, the boundaries between these layers are becoming more fluid. Workloads can move between centralised cloud environments and the edge. Functions traditionally embedded in dedicated hardware can increasingly be implemented in software. Network capabilities can be exposed through APIs and consumed by external applications. In an intelligence-centric architecture, the network is no longer simply a route between a device and a cloud. It becomes part of a distributed computing environment in which devices, networks, models and physical systems interact in real time.

The telecom intelligence stack is distributed across many players, but operators remain uniquely positioned across the greatest number of layers



Layers: 1 Semiconductor • 2 Compute and infrastructure • 3 Telecom network • 4 Data and network knowledge • 5 AI software and orchestration • 6 Models and intelligence • 7 Autonomy and control • 8 APIs, services and applications • H Horizontal (security, governance, standards)

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India's position across the stack

India is already in the stack. The opportunity lies in depth.

India does not enter the intelligence era as a follower. It brings a vast telecom market, deep software and engineering capability, rapidly expanding AI infrastructure and a growing base of indigenous telecom technology. The IndiaAI Mission, indigenous 4G and 5G programmes, and the Bharat 6G Alliance reflect growing capabilities across AI infrastructure, telecom software, network platforms and standards development. The greater opportunity lies in the layers where strategic influence and value creation are highest, including semiconductors, AI accelerators, advanced hardware and specialised equipment. India's challenge is therefore not entry, but progression.

To assess India's position across the telecom intelligence stack, we evaluate each layer against four dimensions.



Based on the above factors, the layers are classified as below

Strong
Proven at national scale with meaningful domestic technology.

Emerging
Growing capability and adoption, with continued dependence in critical areas.

Early
Pilot-stage deployment or nascent domestic capability.

Table 2.3 How each layer scores on the four dimensions (H = High, M = Medium, L = Low)

Layers	01	02	03	04	Assessment
Semiconductors	L	M	L	L	Early
Compute and infrastructure	M	M	L	L	Emerging
Telecom network	H	H	M	M	Strong
Data and network knowledge	H	M	M	H	Strong
AI software and orchestration	M	M	M	M	Emerging
Models and intelligence	L	M	L	M	Emerging
Autonomy and control	M	L	L	L	Early
APIs, services and applications	L	L	L	M	Early

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Table 2.2 - India's position across the telecom intelligence stack

Telecom intelligence stack layer	India's current state and key initiatives	Assessment
Semiconductors	INR10 billion allocated under India Semiconductor Mission 2.0 for FY27 to strengthen semiconductor design, development and packaging capabilities, supporting the growth of India's chip ecosystem[5].	**Early**
Compute and infrastructure	Data-centre capacity increased from approximately 375 MW in 2020 to 1,500 MW in 2025[6], with 38,231 GPUs onboarded and a further 20,000 announced[6][7]. Major investments continue to accelerate the ecosystem, including Reliance Jio's planned 3 GW AI and data-centre campus in Jamnagar[37], Nxtra by Airtel's AI infrastructure expansion[38], and Google's proposed USD15 billion AI hub in Visakhapatnam[39].	**Emerging**
Telecom network	More than 563,000 5G BTSs have been deployed[8], while indigenous technologies are gaining traction through C-DOT's core network and Tejas Networks' RAN equipment, supporting over 97,000 indigenous 4G sites[9][28] and strengthening India's domestic telecom equipment ecosystem.	**Strong**
Data and network knowledge	Initiatives such as AIKosh and India's Digital Public Infrastructure are expanding access to telecom-scale datasets while strengthening data-sharing and governance frameworks.	**Strong**
AI software and orchestration	Strong software engineering and systems integration capabilities support indigenous OSS/BSS platforms, network orchestration solutions and AI-enabled network automation initiatives.	**Emerging**
Models and intelligence	The Department of Telecommunications (DoT) AI and big data platform, Artificial Intelligence and Facial Recognition (ASTR), flagged and disconnected 8.8 million mobile connections that failed mandatory subscriber re-verification[10]. In parallel, AI-enabled fraud monitoring generated alerts on more than 7 million high-risk transactions, strengthening telecom security and consumer trust[11]. At the same time, initiatives such as BharatGen, which supports 22 Indian languages[12]; and emerging players such as Sarvam AI are helping strengthen India's foundation-model ecosystem.	**Emerging**
Autonomy and control	Airtel and Reliance Jio are using AI to automate network operations through predictive troubleshooting, anomaly detection, automated root-cause analysis, network optimisation, and AI-assisted support for operations and field teams[14][22].	**Early**
APIs, services and applications	Telecom networks are becoming increasingly programmable through network APIs, programmable connectivity and network slicing, enabling new enterprise applications across sectors such as healthcare, agriculture, logistics and smart cities.[15]	**Early**

Ratings are directional and based on deployment, domestic IP, global value-chain participation and import dependence

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What the stack reveals

India's AI ambition extends well beyond building models. Initiatives such as the IndiaAI Mission, AIKosh, Digital Public Infrastructure and the India Semiconductor Mission are collectively strengthening multiple layers of the telecom intelligence stack, spanning compute, data, models, applications and enabling infrastructure.

This is particularly significant for telecommunications. As intelligence becomes increasingly distributed, networks, data centres, edge locations and trusted digital platforms are no longer simply supporting connectivity. They are becoming part of the infrastructure on which intelligence itself depends. In this environment, telecom evolves from a connectivity business into a foundational layer of sovereign AI.



India's strengths are concentrated in the layers where software, networks, data and intelligence converge. These are the layers where intelligence is increasingly created, deployed and monetised.



The deeper layers, particularly advanced semiconductors, accelerators and parts of the compute ecosystem, remain more globally distributed.

This is both a strategic constraint and a prioritisation choice. Different layers of the stack operate under distinct technological and economic constraints. From a sovereign AI perspective, the objective is not to replicate all layers domestically, but to build capability where strategic control delivers the meaningful economic, innovation and resilience benefits, while remaining integrated with global ecosystems where scale and specialisation are concentrated.

The telecom intelligence stack is more than a technology architecture. It is a framework for understanding where India can create, capture and sustain advantage in the intelligence era.

Translating architecture into industrial capability

Telecom intelligence stack explains where intelligence is created, where dependencies emerge and where strategic leverage sits. It does not explain where economic value is ultimately captured. To answer that question, it is necessary to move beneath the architecture itself and examine the physical value chain that supports it. Strategic control depends on who designs, builds, integrates, tests and maintains the physical and software capabilities beneath the stack. The discussion therefore shifts from technology capability to industrial capability, and from control of the stack to participation in the industries that build it.

The next chapter explores this transition in greater detail, examining how telecom, AI, semiconductors and electronics intersect to create economic value, and where India can strengthen its position within that value chain.

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Chapter 03

India's manufacturing potential

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India's manufacturing potential

India’s first manufacturing transition established scale in electronics production and final assembly. The next transition must deepen domestic participation in product design, components, semiconductors, software, testing and intellectual property. The relevant measure of success is therefore not production volume alone, but the share of value created, retained and exported from India.

Moving from assembly to value creation requires deeper participation in technology, components, software and intellectual property.

Manufacturing scale remains important, but it is only part of the equation. Long-term advantage comes from capabilities that extend beyond production alone.

Mapping the telecom manufacturing value chain

Telecom manufacturing is often discussed as though it were a single industry. In reality, it is a chain of activities, each with different capability requirements, import dependencies and economic significance.

The key question is not what India manufactures, but where it participates in the value chain. Some segments primarily create scale through assembly, while others capture value through intellectual property, software, components and silicon. The deeper a country participates in these layers, the greater its ability to capture economic value.



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The table below maps the major segments of the telecom manufacturing value chain and highlights where India has already established capability, where value addition is emerging and where significant opportunities remain.

Table 3.1 - The telecom manufacturing value chain and India's position

Segment	What it covers	India's position today	Primary Value Opportunity
Devices and customer premises equipment (CPE)	Handsets, routers, optical network terminals (ONTs) and other customer equipment	Handsets reached INR6,270 billion of production and INR2,590 billion of exports in FY26[13]. Routers and CPE are increasingly made domestically.	Scale and Assembly
RAN and radio equipment	Baseband units, remote radio heads, massive multiple input multiple output (MIMO) radios	Tejas Networks supplies the indigenous radio and baseband infrastructure underpinning BSNL's nationwide 4G network, one of the world's largest deployments of domestically developed telecom technology[28]. Private operators' 5G radios have come mainly from global vendors	System Design & Integration
Optical transport and fibre	Transport systems, transceivers, fibre and cable, preform	HFCL signed a five-year optical cable supply agreement worth nearly USD1.1 billion with a global multinational and has approved a preform plant targeted for 2029[16][40].	Equipment & Module Value Addition
Semiconductors and RF components	Baseband and RF chips, power amplifiers, memory, packaging	Twelve projects are approved under the India Semiconductor Mission, with three already in commercial production, with design tools reaching more than 332 academic institutes and 105 start-ups[17].	Design, Packaging & Silicon
Antennas and passive components	Antennas, filters, coils, capacitors, connectors, printed circuit boards (PCBs)	About 60% import substitution reported in telecom, in categories such as antennas, gigabit passive optical network (GPON) and CPE[19]. ECMS approvals now include antennas, filters and coils, with filters and coils to be made in India for the first time.	Component Ecosystem Development
Core network and software	4G/5G core and operations software	C-DOT's core and Tejas Networks' radio solutions demonstrate India's growing ability to deploy indigenous telecom technologies at national scale, with the stack already operating across BSNL's production network[28].	Software & Intellectual Property
Testing and certification	Conformance, security and reliability assurance	DoT's Mandatory Testing and Certification of Telecom Equipment (MTCTE) 2017, covers essential requirements such as network safety, electromagnetic compatibility, radio-frequency emission limits[29].	Assurance & Ecosystem Capability

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What the table shows. India's manufacturing footprint is strongest in assembly, integration and software-led segments, while deeper value pools increasingly reside in semiconductors, specialised components, optical technologies and intellectual property. The opportunity is therefore not simply to manufacture more products, but to participate in a larger share of the value chain through design, components, software and advanced manufacturing capabilities.

The assembly paradox

India has achieved approximately 60 per cent import substitution in telecom equipment, yet more than 80 per cent of several critical components continue to be imported[19][20].



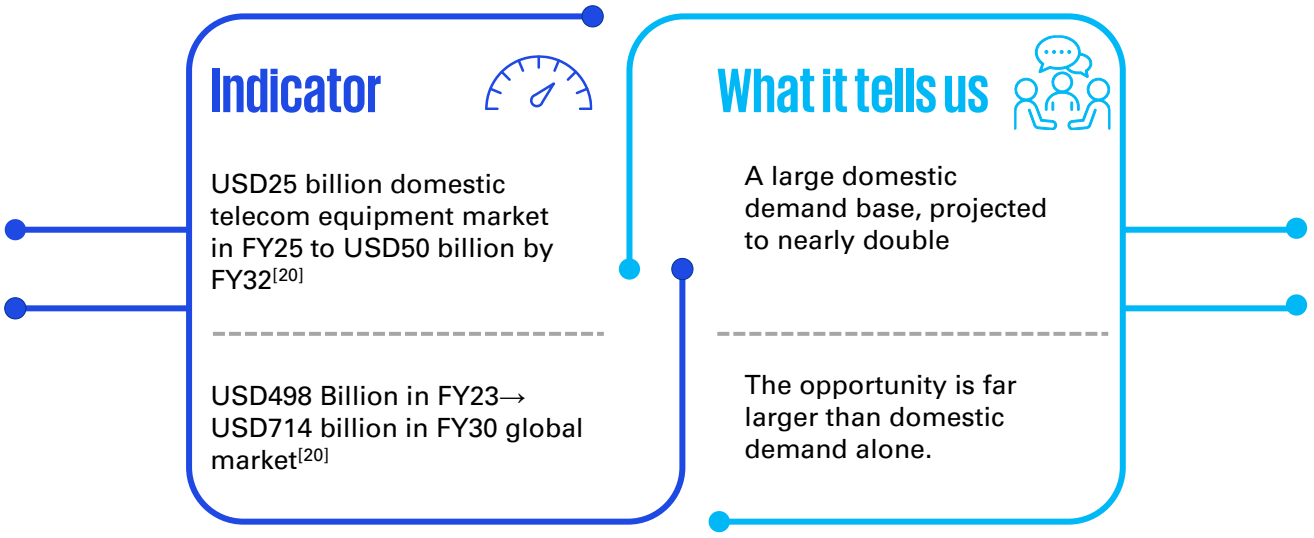
The distance between the two is the gap between assembly and value addition.

This distinction helps explain why production and exports can grow rapidly while domestic value addition remains relatively modest. The key opportunities remain in design, semiconductors, RF systems, optical components, software and intellectual property.

3.2 Sizing the opportunity

The importance of value capture becomes clearer when viewed against the scale of the opportunity. Growth in 5G, fibre, cloud infrastructure and AI is expanding the market for telecom equipment, components and supporting technologies.

Table 3.2 - The Opportunity in two numbers



India's telecom and network equipment market was worth around USD25 billion in FY25 and is projected to reach approximately USD50 billion by FY32, a compound annual growth rate close to 10 per cent a year[20]. The global market is expected to expand from USD498 billion in FY23 to USD714 billion by FY30, or 5.3 per cent a year[20]. Domestic demand is therefore compounding at nearly twice the global pace, supported by 5G expansion, fibre build-out, data centre growth and AI infrastructure, in a market already serving more than 1.2 billion subscribers[20].

These numbers point to a simple conclusion: India does not have a demand problem. The domestic market already provides scale. The larger challenge is increasing the share of value retained through design, components, semiconductors, software and intellectual property.

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Table 3.3 - Opportunity drivers

Driver	Why It matters
5G rollout and network densification	Expanding coverage and enterprise use cases increase demand for radios, antennas, transport systems and core-network upgrades.
Rising data consumption	Continuous network expansion requires additional optical transport, routers, switches and processing infrastructure.
AI infrastructure growth	Data centres, inference clusters and edge computing environments increase demand for fibre, optical systems and power infrastructure.
Fibre and broadband expansion	Broadband growth drives investment in optical equipment, transceivers and transport networks.
Enterprise digitisation	Private 5G, industrial automation and cloud adoption increase demand for secure, low-latency communications infrastructure.

What makes these drivers particularly significant is that they increasingly reinforce one another. The same fibre networks, optical systems, routers, data-centre infrastructure and semiconductor-intensive products that support telecom networks are also becoming essential building blocks of AI infrastructure.

Significant opportunities lie at the intersection of communications and AI infrastructure including optical transport, specialised semiconductors, RF systems, edge-computing platforms, network software and intelligent network operations.

As a result, the question is no longer whether India can participate in telecom manufacturing. The question is where along this expanding value chain it can build the competitive capabilities with long-term relevance, and that requires prioritisation.



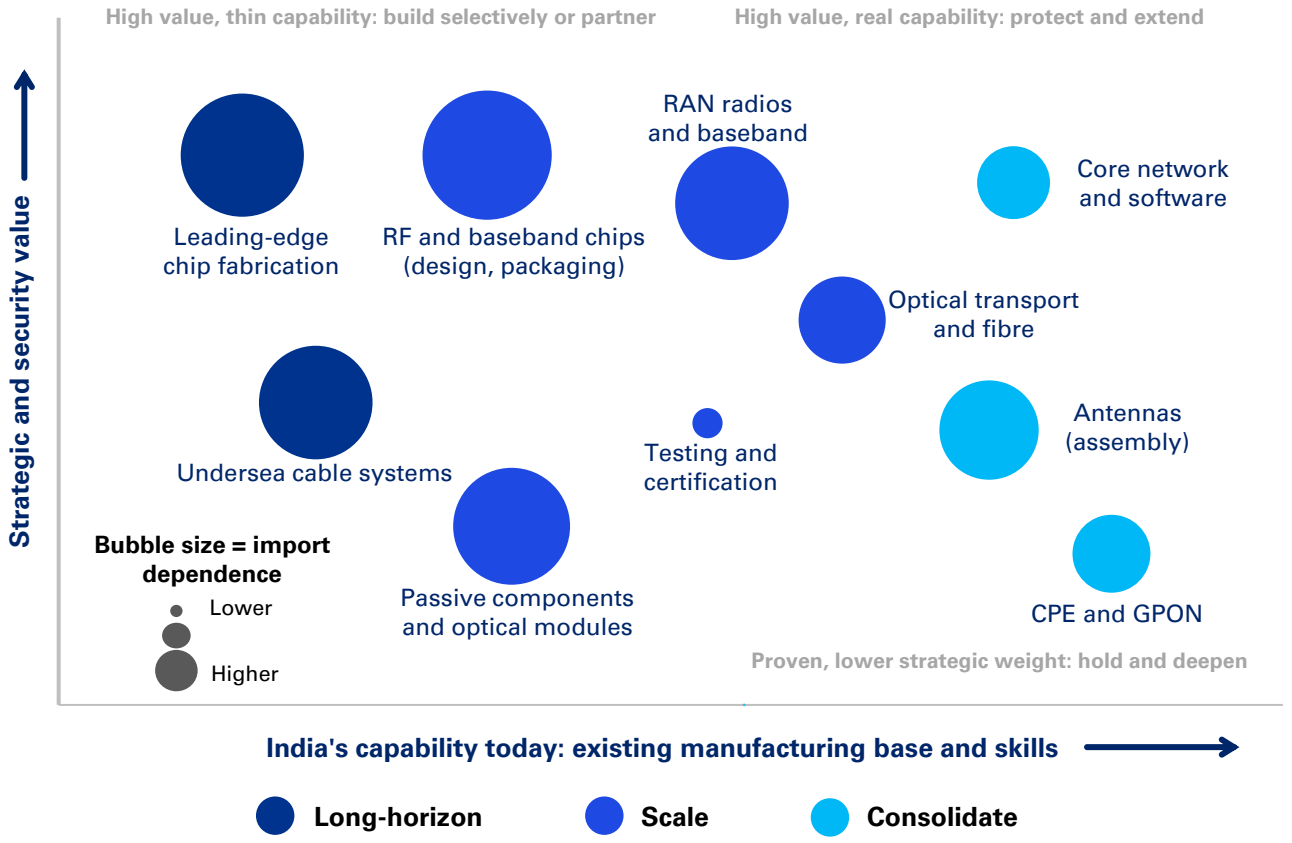
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Priority matrix for India

The telecom manufacturing value chain requires selective prioritisation rather than equal participation. Priorities reflect four considerations: economic value potential, strategic and supply-chain importance, current domestic capability, and the feasibility of achieving global competitiveness. Applying these criteria produces three pathways: consolidate established positions, scale adjacent capabilities with credible domestic foundations, and pursue partnership-led participation in capital-intensive, long-horizon segments.

The figure below evaluates key telecom manufacturing segments through this lens, identifying where India can consolidate existing strengths, where capability can be scaled, and where a longer-term horizon is required.

Figure 3.1 - KPMG in India analysis - Priority matrix for telecom manufacturing segments



Methodology: Figure 3.1 positions telecom manufacturing segments across two dimensions: India's current capability (horizontal axis) and strategic value (vertical axis). Current capability reflects factors such as domestic manufacturing presence, technology ownership, engineering expertise, deployment scale and ecosystem maturity. Strategic value reflects a segment's contribution to economic value capture, technological competitiveness, supply-chain resilience and sovereign AI objectives. Bubble size indicates import dependence, with larger bubbles representing greater reliance on imported technologies, components, equipment or suppliers. Assessments are based on evidence presented throughout this chapter and reflect conditions during 2024-2025. The chart is intended as a comparative strategic assessment rather than a statistical index.

The figure points to three distinct strategic paths.



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The figure points to three distinct strategic paths.

Consolidate: CPE and GPON, antenna assembly, core network and software.

These segments represent India's established positions within the telecom value chain. Import substitution in telecom has reached approximately 60 per cent, with India becoming nearly self-reliant in categories such as antennas, GPON and CPE[19].

The priority is now to increase domestic value addition, deepen supplier ecosystems and strengthen intellectual property ownership, particularly in software-intensive areas such as the core network. As incentive-led growth matures, competitiveness is likely to be shaped increasingly by innovation, ecosystem depth and product ownership rather than policy support alone.

Scale: RAN radios and baseband, optical transport and fibre, passive components and modules, RF and baseband chips (design and packaging), and testing.

These segments are particularly well positioned for near- to medium-term potential because they combine high strategic value with significant import dependence, while already possessing a foundation of domestic capability on which further scale can be built.

The BSNL deployment demonstrates that indigenous capability in telecom equipment is technically feasible at national scale. Tejas Networks supplied radio and baseband equipment for approximately 97,000 sites, launched a 64-transmit, 64-receive (64T64R) massive MIMO radio, and secured its first international commercial order for 4G/5G wireless products[21][33]. Similarly, HFCL's USD1.1 billion optical fibre agreement highlights growing competitiveness in optical infrastructure and transport systems[16]. These examples suggest that the challenge is less about technological capability and more about ecosystem depth, supplier development and continuity of demand.

Importantly, these segments sit at the intersection of telecom and AI infrastructure. Optical transport systems, fibre networks, RF modules, routers and semiconductor-intensive products are becoming critical inputs not only for communications networks, but also for data centres, AI factories and distributed compute environments. As a result, the addressable market extends well beyond telecom itself.

Long-horizon: leading-edge chip fabrication and undersea cable systems.

These segments are strategically important but operate under fundamentally different economics. Both are capital-intensive, technologically concentrated and dominated by a relatively small number of specialised suppliers worldwide.

India's semiconductor ecosystem is beginning to take shape, with **12 approved projects**, three units already in commercial production and the first fabrication facility targeted for 2028[17]. Current efforts are focused **on 28-110 nanometre (nm) nodes,** while more advanced technologies are expected to evolve through partnerships and broader research and development collaboration[13][17]. India also imported approximately USD30 billion of electronic integrated circuits (ICs) in FY26, highlighting the scale of capability still being developed across the broader electronics ecosystem and the continued reliance on globally distributed semiconductor supply chains[18].

Similarly, India is already an important connectivity hub, with 17 international submarine cable systems landing at 14 stations, yet domestic manufacturing capability in undersea cable systems remains limited[23].

The more practical strategy is participation and resilience rather than full replication: strengthening capability in design, packaging and testing for semiconductors, while enhancing landing infrastructure, route diversity and repair capability for undersea networks. The objective is to build meaningful positions within globally distributed ecosystems rather than replicate the full value chain domestically.

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3.4 The import reality

India has made significant progress in telecom equipment manufacturing, but the composition of imports reveals where strategic dependencies remain. Looking only at finished equipment imports provides an incomplete picture. A fuller assessment requires examining three distinct layers of import dependence.

Table 3.4 - Three layers of import dependence

Layer	Finished equipment	Components inside locally assembled equipment	Capital equipment, materials and design tools
What crosses the border	Radios, routers, switches, optical systems	Chips, RF modules, signal processors, memory, displays	Fab tools, specialty chemicals and gases, EDA software
Evidence	Telecom and network equipment imports of USD4-5 billion a year against USD0.6-1 billion of exports[20].	More than 80% of critical components from a single foreign source[20]. USD30 billion of electronic IC imports in FY26[18]	Semicon 2.0's second pillar targets machines and materials, and 105 start-ups now have access to industry-standard EDA tools[17]. ECMS also supports capital equipment.

The picture that emerges is not one of equipment dependence alone, but of dependence embedded deeper in the value chain. Imports increasingly consist of the components, materials, design tools and manufacturing equipment that enable domestic production. As a result, telecom products may be assembled locally while a substantial share of their economic value continues to originate overseas.

The objective is not complete localisation, which is neither economically realistic nor technologically necessary. The more practical goal is to increase domestic value addition in selected strategic layers, diversify concentrated supply chains, secure access to critical technologies and build the capability to design, test, integrate and maintain essential systems within India.

India's current trade profile suggests that this transition remains incomplete. Telecom and network equipment exports have remained between USD0.6 billion and USD1 billion annually against imports of USD4-5 billion, while more than 80 per cent of several critical components continue to be sourced from a single foreign market. The result is a significant gap between where products are assembled and where much of their value is created[20].

That gap is reflected in domestic value addition. Despite substantial growth in manufacturing output, domestic value addition in the telecom sector remains below 20 per cent, with activity concentrated in final assembly while higher-value components, semiconductors and specialised subsystems are imported. The economic prize therefore lies less in producing more units and more in capturing a larger share of the value embedded within them[20].

This is the gap that initiatives such as PLI, ECMS and the TMZ are seeking to address. Beyond reducing imports, the broader objective is to deepen domestic participation in the higher-value segments of the telecom intelligence stack, including semiconductors, radio systems, optical technologies, software and AI infrastructure.

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Chapter 04

The policy toolkit

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If the telecom manufacturing value chain explains where value can be captured, India's policy toolkit reflects how the country is attempting to participate in those layers.

Over the past five years, India has progressively assembled a set of interventions spanning manufacturing, components, research, semiconductors and industrial infrastructure. Viewed together, these initiatives form a layered industrial architecture designed to move the country beyond assembly and towards deeper value addition.

The toolkit reflects the different stages of the value chain, from design and components to manufacturing and deployment.

Scale → Components → Research → Semiconductors → Ecosystems

Together, these layers address progressively deeper layers of capability and, ultimately, a larger potential source of long-term value capture.

Table 4.1 - Building Capability Across the Telecom Manufacturing Value Chain

Instrument	Outlay (INR)	Output So Far
Telecom Production Linked Incentive (2021) focused on manufacturing scale and domestic production[24].	121.95 billion	INR 1,011 billion sales
India Semiconductor Mission 1.0 and 2.0 have extended the ambition into semiconductors and advanced electronics[13].	1,270 billion as per ISM 2.0	12 approved units worth INR1,640 billion under ISM 1.0
Telecom Technology Development Fund (2022) targeted indigenous research, intellectual property and product development[25].	5.42 billion	136 projects
Electronics Component Manufacturing Scheme (2025) addressed the component ecosystem beneath finished products[26][36].	400 billion	106 approvals
Telecom Manufacturing Zone (2026) introduced a cluster-based approach to industrial infrastructure[27].	4.93 billion support	Zone approved

Taken together, these programmes indicate a shift from production-led incentives towards a broader capability-building agenda. PLI supports manufacturing scale; ECMS targets components; TTDF supports research and indigenous product development; semiconductor programmes address chips, materials and design; and the TMZ seeks to strengthen shared infrastructure, testing and clustering. The next step is to connect these instruments through common outcomes for domestic value addition, exports, intellectual property(IP), supplier depth and trusted procurement.

Some programmes focus on expanding production and manufacturing scale. Others aim to deepen local value addition through components, research, intellectual property and semiconductors. More recent initiatives seek to strengthen the ecosystem itself through testing infrastructure, industrial clustering and supply-chain development.

The table further maps where the various instruments contribute across the value chain and highlights how the programmes increasingly reinforce one another rather than operating in isolation.

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Table 4.2 - Where the toolkit acts across the value chain (assessment; ● main focus, ○ secondary)

Instrument	Assembly	Parts and modules	Chips and materials	Design and IP	Testing	Cluster	Demand
Telecom PLI	●			○			
ECMS		●	○				
TTDF				●			
Semicon 2.0			●	○			
Telecom Manufacturing Zone	○	○			○	●	
Mandatory testing (MTCTE)					●		
Public procurement and trusted-source rules							●

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Different instruments, different time horizons

Not all programmes generate results at the same pace. Production-linked incentives can create visible gains in manufacturing output and exports relatively quickly. Component ecosystems, semiconductor capability, testing infrastructure and intellectual property typically evolve over much longer periods.

This distinction is important because some of the most strategically significant capabilities often emerge through investments whose outputs are less visible in production statistics. Component ecosystems, design capability, patents, telecom software and semiconductor expertise may not immediately appear in manufacturing numbers, yet they form the foundation of deeper industrial competitiveness.

The toolkit should therefore be viewed not as a set of parallel programmes, but as a layered effort to strengthen different parts of the value chain simultaneously.

The telecom manufacturing zone: from firms to ecosystems

The newest element of India's manufacturing toolkit is the TMZ at Gwalior. Unlike earlier interventions that focused on production, components or research, the TMZ is designed to address a different challenge: ecosystem development.

Supported by approximately INR4.93 billion of central infrastructure funding, including INR2.70 billion for testing and laboratory facilities, the zone combines manufacturing infrastructure, common testing capabilities, research facilities and policy support within a single industrial cluster[27].

Its significance lies less in the land area or projected investment figures and more in the logic behind it. Manufacturing ecosystems succeed when suppliers, manufacturers, researchers, testing facilities and customers operate within the same environment. Clustering reduces coordination costs, accelerates learning and creates specialised capabilities that are difficult to build through individual firms acting alone.

In that sense, the TMZ represents a shift from supporting individual investments to building the conditions under which an industry can scale.

A particularly notable feature is the planned testing and assurance ecosystem. The zone proposes specialised laboratories covering areas such as 4G/5G systems, core networks, optical fibre, routers, satellite communications, security testing, passive optical networks (PON) equipment and internet of things (IoT) devices[27].

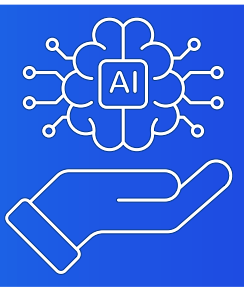
This matters because the ability to build a product is only part of the challenge; the ability to prove that it is reliable, secure and interoperable is equally important. Testing, certification and assurance provide that proof, making them a critical part of the manufacturing ecosystem and an often-underappreciated enabler of export competitiveness.

The first phase of telecom manufacturing was focused on building scale, attracting investment and reducing dependence on imported finished products. The emerging phase is increasingly concerned with something more difficult: strengthening the layers where value actually resides.

Those layers include components, design, semiconductors, intellectual property, testing and ecosystem capability. They are also the layers that determine how much of the economic value embedded within telecom and AI infrastructure remains within the domestic economy.

This distinction is important because the next stage of industrial competitiveness is unlikely to be defined by production volumes alone. Rather, it is expected to reflect the ability to move progressively from assembly to design, from design to proprietary technology, and from proprietary technology to ecosystem leadership.

India's next manufacturing transition is not simply about producing more telecom equipment. It is about increasing participation in the layers where value, capability and long-term competitive advantage converge.



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Chapter 05

Conclusion



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Conclusion

Telecom is entering an era in which connectivity demand, AI infrastructure and industrial capability are becoming increasingly interdependent. As networks evolve from connectivity platforms into the infrastructure that powers intelligence, capabilities across software, data, compute and communications are becoming increasingly important to competitive advantage.

India enters this transition from a position of growing strength. Domestic capabilities in software, network platforms and data provide the foundations of a credible Telecom Intelligence Stack, while AI compute capacity has expanded rapidly from a standing start to tens of thousands of GPUs within a few years.

A decade of sustained industrial policy has also transformed India from a major importer of mobile handsets into one of the world's leading mobile-device manufacturing and export hubs. Building on this foundation, a set of complementary policy instruments, including the Telecom PLI, ECMS, TTDF, Semicon 2.0 and the TMZ, are extending capability across different layers of the ecosystem, spanning manufacturing, innovation, semiconductors and industrial infrastructure. Together, these developments point to a broader shift: India's AI ambitions and manufacturing ambitions are not separate agendas, but mutually reinforcing elements of a single strategy to strengthen the country's position in the emerging telecom intelligence ecosystem.

AI is not only increasing demand for digital infrastructure; it is also strengthening the case for domestic industrial capability. Together, they create a reinforcing cycle between infrastructure deployment, manufacturing scale and technological capability.

The early signs are encouraging. Telecom equipment import substitution has reached approximately 60 per cent, with India becoming nearly self-reliant in categories such as antennas, GPON and CPE[19]. Growing investment commitments under the ECMS and strong industry interest in the TMZ further suggest increasing confidence in India's ability to expand its capabilities across telecom manufacturing and semiconductors.

Recommendations

- Policymakers should publish annual value-addition, exports, IP and supplier-development outcomes across major schemes, while aligning incentives, testing infrastructure and trusted procurement.
- Operators should provide transparent multi-year demand signals and use reliability-gated procurement to help qualified domestic products scale.
- Original equipment manufacturers (OEMs) and investors should prioritise components, optical systems, radio technologies, network software, packaging and testing, while approaching leading-edge fabrication through patient, partnership-led investment.

By 2030, four outcomes may serve as key indicators of progress:

Broader adoption of indigenous telecom platforms, commercial scale in RF and baseband chips, higher domestic value addition in components and modules, and the conversion of announced investments into operational manufacturing capacity. Taken together, they offer a measure of India's progress from assembly-led growth towards deeper capability and greater value capture.

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Glossary

Abbreviation	Full Form
FY	Financial Year
PLI	Production Linked Incentive
ECMS	Electronics Component Manufacturing Scheme
TTDF	Telecom Technology Development Fund
TMZ	Telecom Manufacturing Zone
EB	Exabytes
TowerCo	Tower Company
InfraCo	Infrastructure Company
NetCo	Network Company
AI	Artificial Intelligence
CPUs	Central Processing Units
GPUs	Graphics Processing Units
NPUs	Neural Processing Units
RF	Radio Frequency
RAN	Radio Access Network
OSS/BSS	Operations Support Systems/Business Support Systems
MLOps	Machine Learning Operations
EDA	Electronic Design Automation
APIs	Application Programming Interfaces
NaaS	Network as a Service
MW	Megawatts
BTS	Base Transceiver Station
ASTR	Artificial Intelligence and Facial Recognition
ISM	India Semiconductor Mission
CPE	Customer Premises Equipment
GPON	Gigabit Passive Optical Network
MTCTE	Mandatory Testing and Certification of Telecom Equipment
MIMO	Multiple Input Multiple Output
ONTs	Optical Network Terminals
PCBs	Printed Circuit Boards
PON	Passive Optical Network
IoT	Internet of Things
OEMs	Original Equipment Manufactures
IP	Intellectual Property
ICs	Integrated Circuits
nm	Nanometre

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