



InfraWatch

Sectoral Review of FY 2025-26

Foreword



Rajkiran Rai G., Managing Director

India's infrastructure sector continues to be a cornerstone of the country's growth story, underpinning its aspirations of becoming a developed economy by 2047. Over the past year, the sector has demonstrated remarkable resilience and momentum, supported by sustained public investment, evolving policy frameworks, and increasing private sector participation. The *InfraWatch FY 2025-26* report presents a comprehensive assessment of this progress, while also outlining the opportunities and challenges that lie ahead.

The analysis highlights that India's infrastructure landscape is undergoing a structural transformation. Across sectors such as energy, transport, logistics, digital infrastructure, and urban development, there is a clear shift towards scale, sustainability, and integration.

The expansion of renewable energy capacity, modernization of transport networks, growth in multimodal logistics, and increasing digital penetration are collectively enhancing productivity and competitiveness. At the same time, emerging segments such as data centres, energy storage, and urban transit systems are opening new avenues for investment and innovation.

Policy support continues to play a pivotal role in driving this transformation. Programs focused on asset monetization, public-private partnerships, and long-term financing mechanisms are enabling more efficient capital deployment and crowding in private investment.

Notwithstanding this progress, certain challenges remain. Project execution risks, land acquisition issues, evolving regulatory frameworks, and global macroeconomic uncertainties continue to influence the pace and quality of infrastructure development. Additionally, the growing need for climate-resilient and sustainable infrastructure necessitates innovative financing solutions and stronger institutional capacity.

This report, prepared by our Economist, and Industry Research teams, aims at providing data-driven insights and forward-looking perspectives on India's infrastructure sector. It is intended to serve as a valuable resource for policymakers, investors, developers, and other stakeholders engaged in shaping the country's infrastructure future.

I am confident that with continued collaboration and innovation, India will build a robust, inclusive, and future-ready infrastructure ecosystem.

Executive Summary

India's infrastructure sector sustained strong momentum in FY 2025-26, reaffirming its role as a central pillar of economic growth, employment generation, and long-term competitiveness. Supported by sustained public capital expenditure, increasing private participation, and a stable policy environment, infrastructure development expanded across transport, energy, urban sector, social sector, and digital domains.

The year marked a significant structural shift towards sustainability, scale, and system efficiency. In the energy sector, India crossed a major milestone with over 50% of installed capacity originating from non-fossil fuel sources, supported by rapid renewable energy deployment and declining energy deficits. Parallel investments in transmission, cross-border power trade, and energy storage underscores progress toward grid resilience and energy security.

Transport infrastructure witnessed broad-based advancement. Aviation continued its transition from a metro-centric model to regionally balanced growth, driven by airport expansion, regional connectivity initiatives, and PPP-led monetisation. Roads and highways benefitted from sustained project execution under flagship programmes, improving freight efficiency and last-mile connectivity. Railways strengthened capacity through completion of Dedicated Freight Corridors, network electrification, and modern train services, while ports consolidated gains via capacity augmentation, port-led industrialisation, and logistics integration.

Urban infrastructure emerged as a key focus area amid rapid urbanisation. Large-scale investments in housing, water supply, sanitation, public transport, and solid waste management addressed service delivery gaps while improving urban livability. Flagship missions such as AMRUT, PMAY-U, Smart Cities, and e-Bus Sewa remained central to this transformation. Social infrastructure, particularly health and education, continued to receive enhanced budgetary support, reflecting growing emphasis on human capital development.

Digital and next-generation infrastructure recorded strong traction. Telecom achieved near-universal 5G coverage, data centres expanded rapidly on the back of cloud and AI demand, and indigenous R&D initiatives strengthened technology self-reliance. Emerging sectors such as energy storage, green shipping, and smart logistics gained prominence, opening large investable opportunities.

Despite notable progress, challenges remain. Land acquisition delays, execution bottlenecks, high capital intensity in select sectors, and financing gaps for emerging technologies require continued policy attention. Nonetheless, innovations in project preparation, asset monetisation, risk-sharing mechanisms, and blended finance are improving project viability and crowd-in private capital.

Overall, India's infrastructure sector in FY2025-26 reflects a transition from capacity creation to capability building, with stronger emphasis on sustainability, digital integration, and service quality. With infrastructure spending expected to remain elevated over the medium term, the sector is well positioned to support India's aspiration of becoming a developed economy by 2047.

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01. A Snapshot of the Infrastructure Sector

Infrastructure segment-wise past growth trends and future growth outlook (1/3)

Industry	Growth Drivers	Challenges
Airport	<ul style="list-style-type: none"> • Sustained growth in domestic business and leisure travel • Accelerated development and operationalization of regional airports supported by the UDAN scheme and state-level viability gap funding • Consistent rise in international travel amid improving connectivity to newer destinations • Further airport monetization/PPP-led private participation could support capacity augmentation and operational efficiency 	<ul style="list-style-type: none"> • Macroeconomic/geopolitical uncertainties/global slowdown could affect international passenger traffic growth • Delays in aircraft and engine deliveries may constrain capacity addition by airlines and moderate traffic growth • Heavy capital expenditure required for greenfield airport projects and reliance on a limited pool of private developers with capacity to undertake mega-projects
Energy	<ul style="list-style-type: none"> • Rising urbanization & industrialization • Strong policy support at both Central and state levels • Presence of relatively strong central/off-taker counterparties such as SECI, NTPC etc. • Increasing sustainability initiatives by large C&I customers • Large RE pipeline supported by policy push, with increasing shift toward hybrid/RTC/FDRE capacity and associated storage investments • Continued decline in RE tariffs improving competitiveness vs. thermal • Data centres and push to Electric mobility will continue support healthy demand. 	<ul style="list-style-type: none"> • Significant/persistent backlog of unsigned PPAs/PSAs • Sustaining recent improvements in discom financial health and timely payments • Project execution delays driven by state-specific land acquisition hurdles, localized Right of Way (RoW) issues for transmission lines, grid availability lagging generation pace etc. • Curtailment/grid-integration risks remain material as generation capacity addition outpaces transmission and storage readiness • Growing capital requirement and funding gap for emerging technologies (e.g., green hydrogen, offshore wind) where commercial viability is still stabilizing
Ports	<ul style="list-style-type: none"> • Sustained economic growth • Traction in container cargo volumes • Increasing government focus on port-related industrial clusters & connectivity, coastal shipping, inland waterways etc. • Investments driven by “Green Port” initiatives and mechanization/modernization of existing berths through PPP routes 	<ul style="list-style-type: none"> • Inefficiencies arising from poor last-mile connectivity to the hinterland • Global slowdown and trade disruptions could affect shipping routes, transit times and cargo throughput

Infrastructure segment-wise past growth trends and future growth outlook (2/3)

Industry	Growth Drivers	Challenges
Railways	<ul style="list-style-type: none"> Sustained growth in both passenger and freight traffic, thereby necessitating expansion & modernization of rail network Full operationalization of Eastern and Western DFCs driving higher freight volumes and decongestion Continued network expansion, electrification and station/logistics upgrades supporting freight efficiency and passenger capacity 	<ul style="list-style-type: none"> Stiff competition from road network offering better first-mile and last-mile connectivity Limited private participation in most rail infrastructure segments Land acquisition challenges, interface complexities and dependence on specialized equipment/technology in select projects, thereby leading to project execution delays amid geopolitical uncertainties
Roads	<ul style="list-style-type: none"> Steady traffic growth in line with overall economic activity and rising vehicular penetration Sustained growth in domestic consumption and infra-activity to drive freight traffic Buoyant leisure/tourist travel to support passenger traffic Robust capital recycling through asset monetization avenues like Infrastructure Investment Trusts (InvITs) and Toll-Operate-Transfer (TOT) models, freeing up developer equity 	<ul style="list-style-type: none"> Project delays owing to land acquisition/right-of-way issues, unavailability of construction materials, unseasonal/excessive rainfall etc. Increasing competitive intensity and participation by relatively less-established developers may elevate execution/counterparty risks Potential traffic diversion on select corridors due to alternate routes/modes Tighter project-preparation and land-readiness requirements may moderate near-term awarding, while improving implementation quality over time Low entry barrier compromises quality.
Telecom	<ul style="list-style-type: none"> Rising smartphone penetration and data consumption Continued subscriber upgradation to 4G/5G and growth in data usage Improving ARPU supported by periodic tariff hikes and data monetization Growing monetization opportunities through enterprise 5G use cases, data centers and digital infrastructure integration 	<ul style="list-style-type: none"> Regulatory & policy complexities and uncertainties High capital intensity for spectrum acquisition and network roll-out may continue to pressure leverage and returns Massive capital expenditure requirements for deep-fiberization and densification of networks required to fully support 5G rollout Elevated debt levels and moderate coverage indicators

Infrastructure segment-wise past growth trends and future growth outlook (3/3)

Industry	Parameter	CAGR Growth			
		FY25A	FY26E	FY27P	FY26-FY31P
Airport	Passenger Traffic Volume	9%	3%	6%	6-8%
	Freight Traffic Volume	11%	7%	7%	6-8%
Energy	Power Demand	5%	1%	6%	5-7%
	Peak Power Demand	3%	-2%	10%	6-8%
	Overall Installed Capacity	8%	12%	14%	10-12%
	-Coal	2%	3%	4%	3-5%
	-Solar	29%	42%	27%	20-22%
	-Wind	9%	12%	11%	12-14%
Ports	Cargo Traffic Volume	3%	5%	4%	3-5%
Railways	Passenger Traffic Volume	7%	1%	4%	3-5%
	Freight Traffic Volume	2%	5%	4%	5-7%
Roads	Capex	8%	5%	7%	6-8%
Telecom	Wireless subscribers	-1%	1%	1%	0-2%
	ARPU	12%	10%	13%	9-11%

A: Actual; E: Estimate; P: Projections

02. Aviation Infrastructure



Indian Aviation Overview: Scale, Speed, and Structural Shifts

Quick Facts



India has emerged as the world's third-largest domestic aviation market. The number of airports increased **from 74 in 2014 to 164 in 2025**.



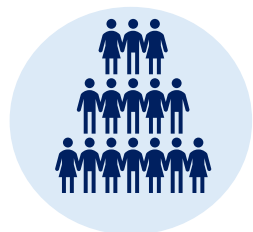
For every rupee spent, the sector generates **more than three times** that value in economic activity and supports over **six times as many jobs** in connected industries.



Today, the sector supports **over 7.7 million jobs indirectly, including 369,000 jobs directly**, the demand for skilled personnel—pilots, engineers, ground staff, and logistics professionals is expected to rise sharply.



Initiatives like **Digi Yatra, Greenfield Airports Policy, and Drone PLI Scheme** are driving innovation and ease of travel.



Since FY20, modernization projects at several airports across the country have successfully raised combined passenger-handling capacity of operational airports to approximately **575 million passengers per annum**.



In FY25, Indian airports handled **412 million passengers**, and the same is projected to increase to **665 million by FY31**.



Air cargo volume grew from **2.53 million metric tonnes (MMT)** in FY15 to **3.72 MMT in FY25**, and 3.6 MMT handled in FY26 (until Feb'26), driven by several key policy initiatives and reforms.



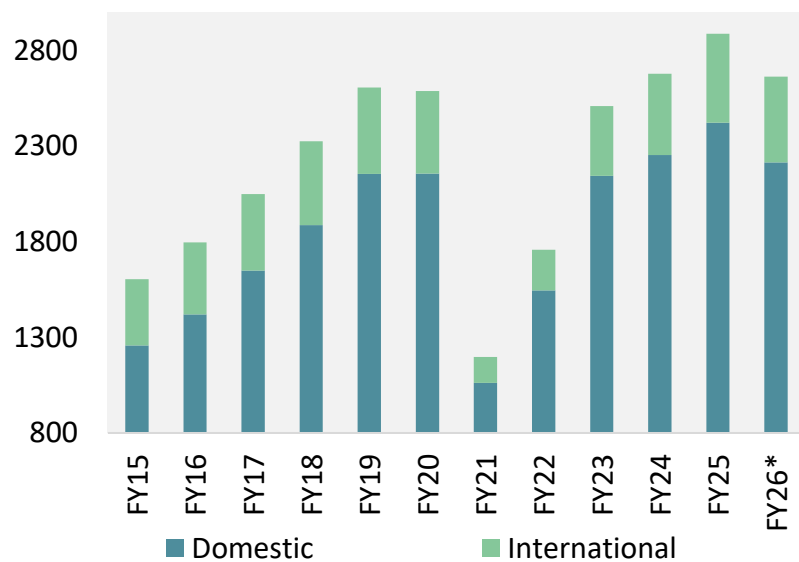
The Greenfield Airports Policy has granted in-principle approval for 24 Greenfield airports, with 13 already operational airports, including the Navi Mumbai International Airport, thereby expanding urban and regional capacity.

Indian Aviation Sector : A snapshot of the demand for air transport in India

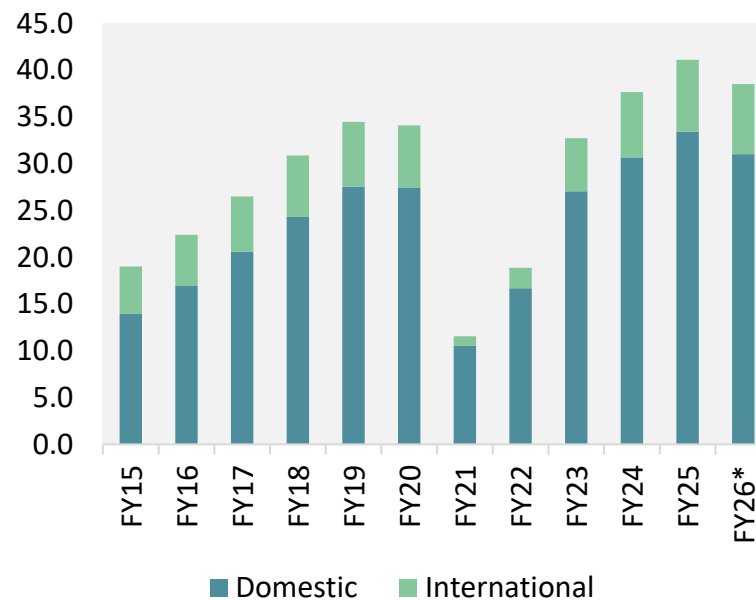
- In the first 11 months of FY26 till February, the passenger handled (International + Domestic) stood at 38.6 cr compared to 37.6 cr passengers in the corresponding period of previous Financial year.
- The Average annual growth rate of passengers handled between 2011- 2019 stood at 11.77% in the pre-covid period. Barring the disruptions caused by pandemic and the post revival period, the average growth rate of passengers handled has returned back to normalcy although a bit higher at 12.2% in the last two years (FY24 and FY25.) The Indira Gandhi Delhi airport remained the busiest airport in 2025 handling ~7.8 cr passengers and 1.1 million metric tonne of cargo.
- The decadal CAGR (Compound Annual Growth Rate) of passengers handled registered an impressive growth rate at ~8% for the period FY15-FY24. Similarly, The CAGR of cargo movement stood at ~4% between FY15 to FY25, while CAGR of aircraft movement stood at ~6% under the said period.

Aviation : Traffic handled

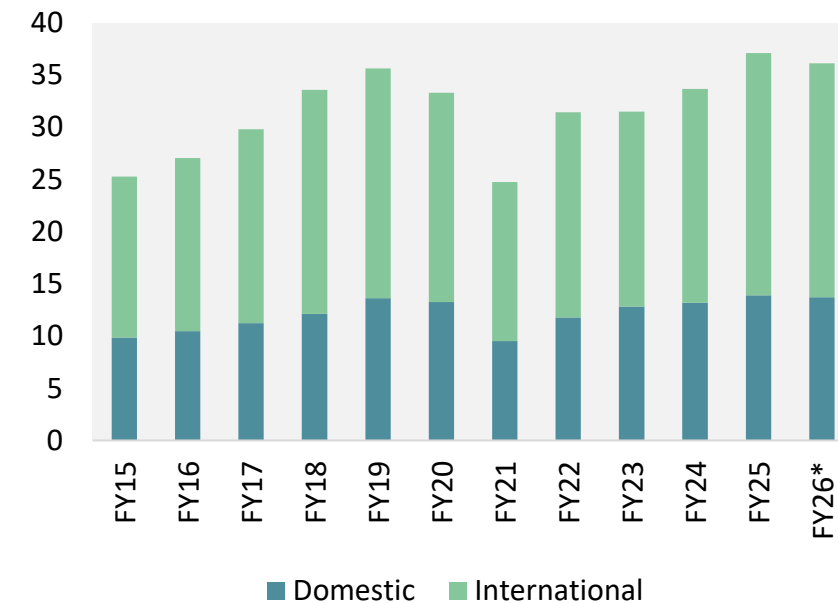
Aircraft movements ('000)



Passenger handled (crore)



Cargo Movement (lakh tonnes)

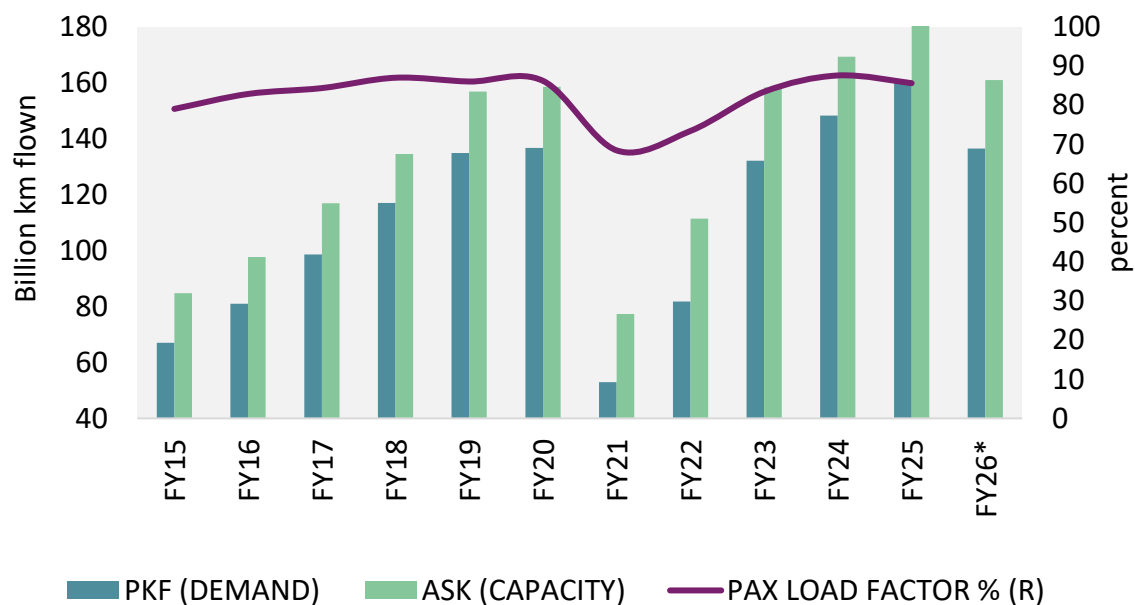


*Till Feb'26 , Source : DGCA, CMIE, NaBFID Economist

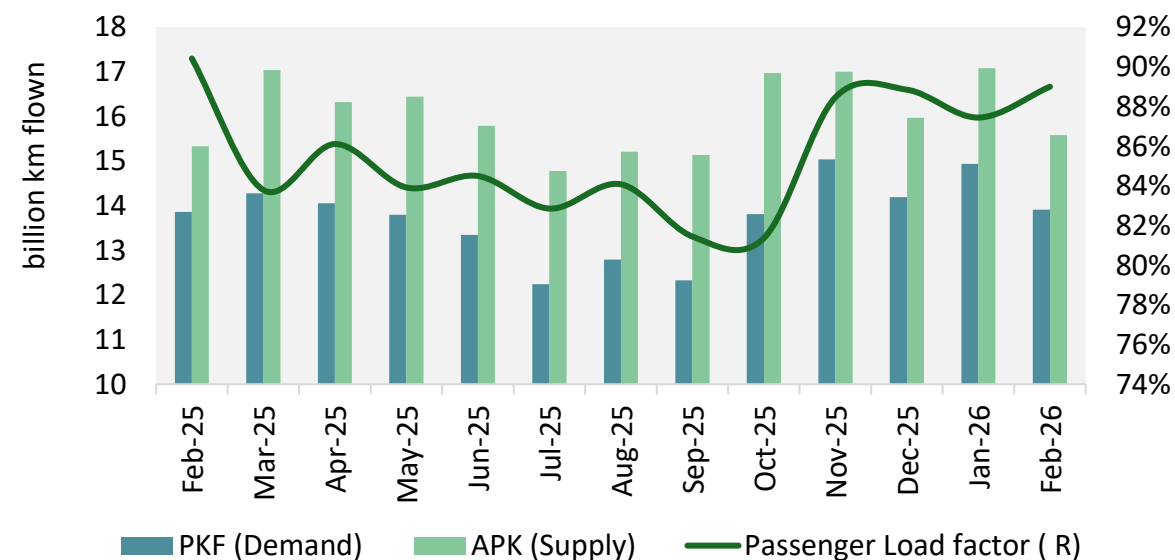
Indian Aviation Sector : Analysing the supply side trends for air transport in India

- In view of the rising demand, airlines have undergone significant expansion in their seating capacity Available Seat Km (ASK), (measuring total passenger-carrying capacity), undergoing a CAGR of 6.6% between FY16 to FY25. Meanwhile, passenger demand denoted by Passenger km flown (PKF) expanded at a CAGR of 7.15 under the said period.
- The Pax load factor (denoting the percentage of available seating capacity filled by paying passengers), has consistently risen from 82.9% in FY16 to 86.4% in FY25. In the first 11 months of FY26 (till Feb'26), the pax load factor stood at an average of 86% signifying robust discretionary demand for air travel.
- Under the Regional Connectivity Scheme- Ude Desh Ka Aam Nagrik (RCS-UDAN), Over 1.56+ crore passengers have travelled, and a total of 3.23 lakh RCS flights have been operated across regional routes nationwide.

Capacity v/s demand in domestic market



Month-wise Capacity v/s demand in domestic market in FY26



*Till Feb'26 , Source: DGCA, CMIE, NaBFID Economist

India's Upcoming Airports: Catalysts of a New Travel Era

- India's aviation sector is entering a new era of expansion. With passenger traffic rising, cargo movement intensifying, and regional connectivity becoming a national priority, several ambitious airport projects are underway across the country. These upcoming airports are not just transport hubs — they are being designed as catalysts for industrial growth, tourism, and balanced regional development.

Name of the airport	Operator	Type of project/ structure	Revenue sharing
Dholera International airport, Gujarat	Dholera International Airport Company Limited (DIACL)	Greenfield/PPP	51% (AAI), 33% Government of Gujarat (GoG), and 16% National Industrial Corridor Development Corporation (NICDIT)
Bhogapuram International Airport, Andhra Pradesh	GMR Airports (GAL)	Greenfield/ PPP (DBFOT)	Revenue-sharing model with the state government, where GMR manages aeronautical and non-aeronautical charges (retail, parking)
Shri Jagannath International Airport, Odisha	Govt. of Odisha (likely with AAI support later)	Greenfield/DBFOT	Yet to be finalized
Kota Airport, Rajasthan:	AAI + Ahluwalia contracts	Greenfield/ conventional EPC(approach	Yet to be finalized
Sonpur Airport, Bihar	Govt. of Bihar (early-stage)	Greenfield/ yet to finalize	Yet to be finalized

Indian Aviation Sector : Road Ahead, Unlocking the Next Phase of Growth

Targets



As India celebrates hundred years of independence in 2047, the government's vision is to increase airports to 350-400 in the next two decades.



By 2040, the passenger traffic is expected to grow six-fold to around 1.1 billion.



India's commercial airline fleet is predicted to grow from 400 in 2014 to around 2359 in March 2040.



The total employment due to aviation sector in 2040 is expected to be around 25 million - emerging as a core engine of India's journey towards becoming a developed economy.

India currently operates approximately 0.11 airports per million people, significantly lower than the US (47.35) and China (0.39)¹⁵, signalling substantial headroom for further growth.



While the sector remains sensitive to global economic cycles and the need for continuous capacity upgradation, the current passenger volumes represent only a fraction of India's potential.



In the near term, ICRA expects domestic passenger traffic growth to remain muted at 0-3% in FY2026, while international traffic for Indian carriers is projected to grow at 7-9%. Its earlier FY2027 projections 6-8% for domestic and 8-10% for international traffic, now carry a downward bias.



Flight cancellations due to airspace closures, along with rerouting of aircraft, are expected to increase fuel burn and operating costs. Airlines are also likely to pass on rising costs through fuel surcharges of around 5-6% of ticket prices, which could dampen demand.

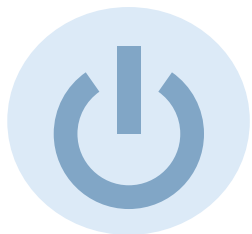




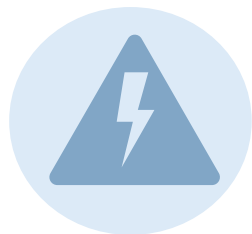
03. Energy Infrastructure

India's Energy Infrastructure: Building Strength and Scale

Quick Facts



Per capita electricity consumption in India has surged to 1460 kWh in 2024-25, marking a 52.6% increase (503 kWh) from 957 kWh in 2013-14.



The average availability of electricity in rural areas has increased from 12.5 hours in 2014 to 22.6 hours in 2025, while urban areas now enjoy up to 23.4 hours of power supply as compared to 22.1 hours in 2014.



Non-Fossil capacity addition in FY26 stood at 55.29 GW making it the highest increase in any year. (Previously the highest increase was 29.5 GW during FY25).



India stands 3rd globally in Renewable Energy Installed Capacity, only behind China (2258 GW) and USA (468 GW) (as per IRENA RE Statistics 2026 with data as on December, 2025).

Advancements in energy generation, transmission, and distribution

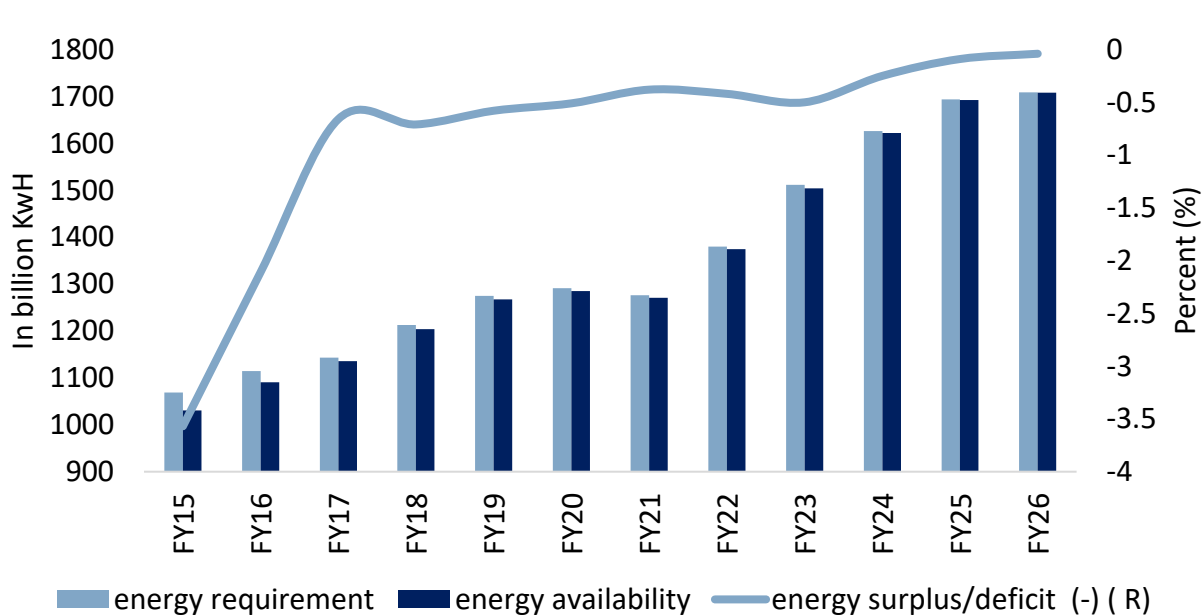


- *The year 2025 marked a landmark period for India's power sector, with historic advancements in energy generation, transmission, and distribution.*
- *From meeting peak power demand of 242.49 GW to reducing energy shortages at the national level to a mere 0.03% in FY 2025-26, the sector demonstrated resilience and commitment to sustainable growth.*
- *With groundbreaking initiatives such as universal electrification, enhanced rural power availability, and the adoption of cutting-edge technologies, India is firmly on the path to becoming a global energy leader.*

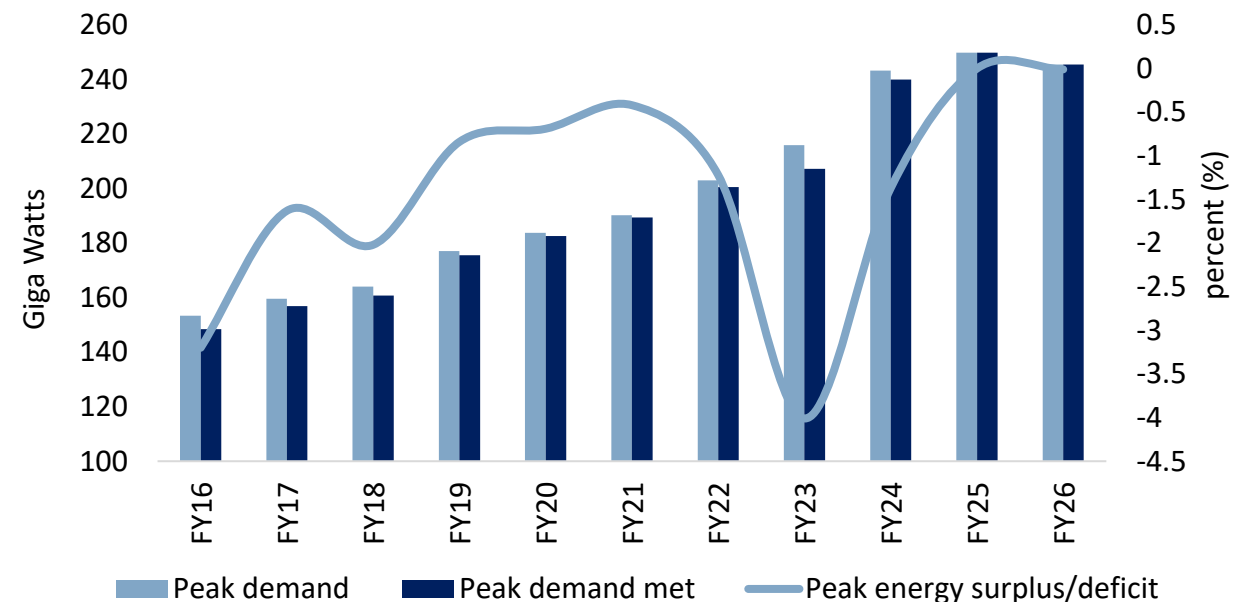
India achieves sufficiency in Energy: Peak Energy deficit falls to 0% in FY25 from ~5% in FY15.

- India's total installed power generation capacity has surged by 104.4%, increasing from 249 GW in FY14, to 524 GW as of Feb'26. Total fossil fuel based capacity stood at ~47% whereas non-fossil fuel-based capacity formed ~53%. Within non-fossil fuel, solar had the highest share at ~27% followed by Wind at ~11%.
- India is set to become the world's second-largest solar market in 2026, with its solar capacity, reaching 150 GW. India recorded its highest-ever annual addition of solar power capacity at around 45 GW in FY26, as well as wind capacity addition at 6.05 GW, marking a major step in the country's clean energy push.
- In FY25, the overall energy deficit stood at 0.09% compared to ~4% in FY15. In FY26, it has fallen further to 0.04%. Similarly, the peak energy deficit in the last decade has tremendously reduced to 0% in FY25 compared to a deficit of ~5% in FY15 (depicted below), showcasing India's expanding capabilities and capacity to meet its growing needs. In FY26, (till Feb'26), the peak energy deficit stood at <0.1%.

Energy - Requirement vs Availability in India



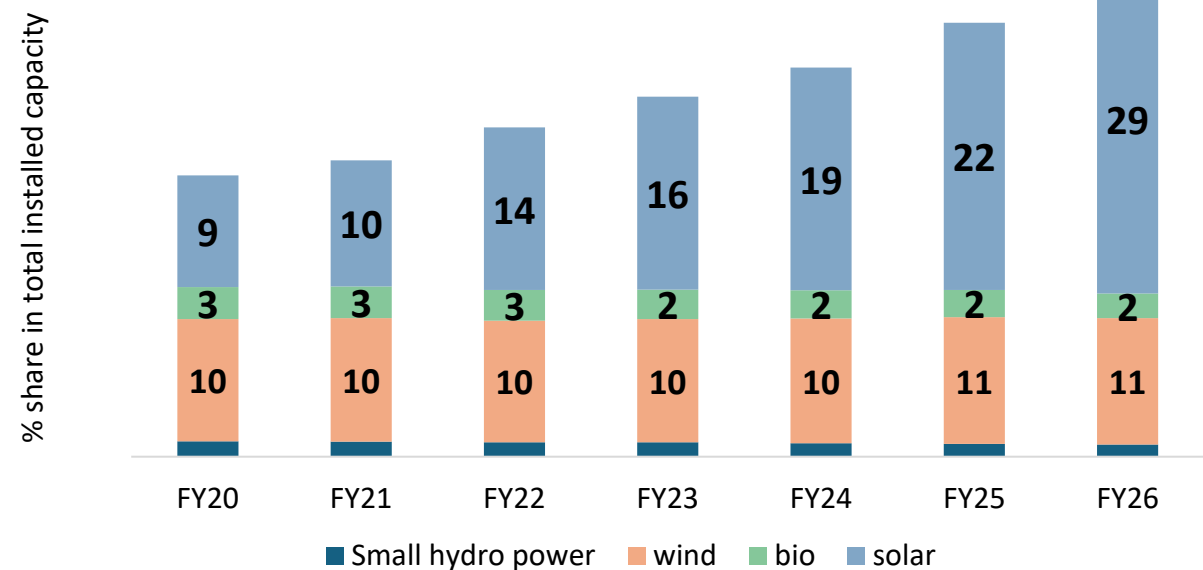
Peak demand vs peak demand met



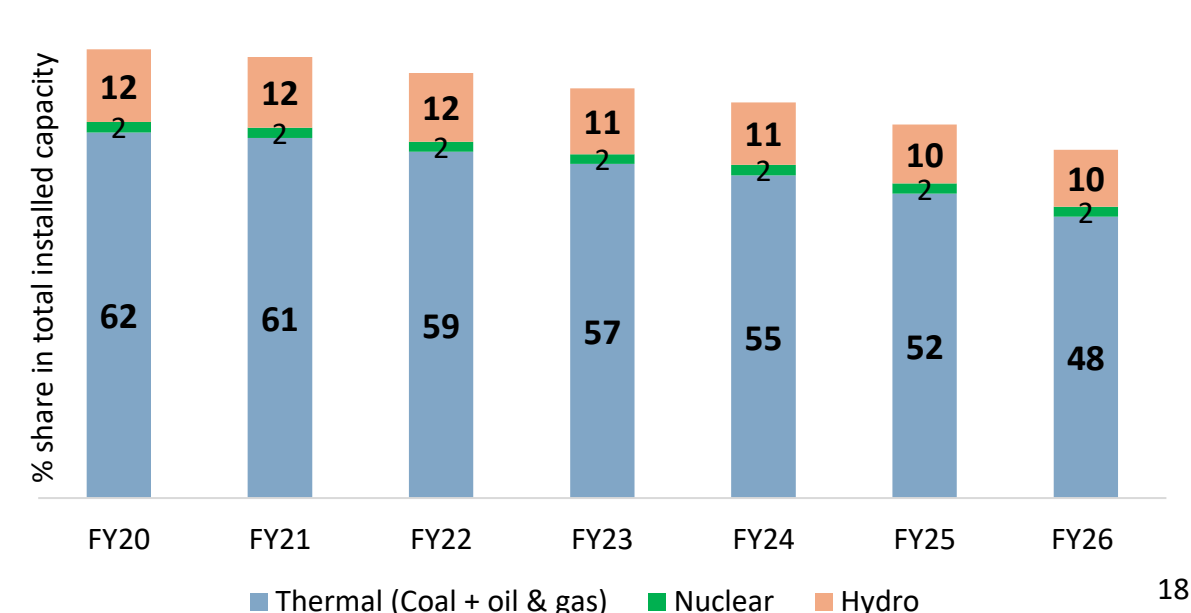
Renewable energy dominates new capacity addition : Solar power addition dominates

- So far, a total of 283.46 GW of capacity from non-fossil fuel sources has been installed in the country as of Mar'26. This includes 274.68 GW RE (150.26 GW Solar Power, 56.09 GW Wind Power, 11.75 GW Bio Energy, 5.17 GW Small Hydro Power, 51.41 GW Large Hydro Power) and 8.78 GW Nuclear Power capacity.
- For further promotion of Renewable Energy (RE) Generation, several initiatives have been undertaken by the government recently such as Foreign Direct Investment (FDI) has been permitted up to 100 percent under the automatic route, Laying of new intrastate transmission lines and creating new sub-station capacity has been supported under the Green Energy Corridor Scheme for evacuation of renewable power, Scheme for setting up of Solar Parks and Ultra Mega Solar Power projects is being implemented to provide land and transmission to RE developers for installation of RE projects at large scale.
- As % share in total installed capacity, solar power holds the highest contribution at ~29% (in renewables) as of Mar'26 compared to 9% in FY20. Meanwhile, although thermal based sources holds the highest contribution (~48%) amongst conventional sources, its overall trajectory has been on the downside since FY20.

Renewable energy source-mix



Conventional energy source-mix



India's energy sector : Cooperation With Neighbouring Countries

- Over the past one-year, various initiatives were undertaken to significantly deepen bilateral ties with neighbouring nations like Bhutan, Nepal, Sri Lanka, Bangladesh, Myanmar as well as global partners such as EU, Indonesia, Australia, Germany, Japan, the UAE, Mauritius, New Zealand, Saudi Arabia, the UK & USA.
- India's strategic location in the South Asian region, coupled with its cross-border linkages with neighbouring countries, enables it to play a pivotal role in the effective utilization and management of regional resources. Import/Export of Electricity with neighbouring countries such as Bhutan, Bangladesh, Nepal and Myanmar for past four years are as under:

Import Million Units (MU) by India

Year	Bhutan	Bangladesh	Nepal	Myanmar
2024-25	6281	0	2150	0
2023-24	5730	0	1725	0
2022-23	7253	0	1385	0
2021-22	7995	0	179	0
2020-21	9381	0	5	0

Export Million Units (MU) by India

Year	Bhutan	Bangladesh	Nepal	Myanmar
2024-25	1764	8084	1686	9.08
2023-24	1868	8394	1850	8.78
2022-23	522	8581	1552	9.8
2021-22	322	7327	2127	8.81
2020-21	219	7555	1870	9.24

- The National Electricity Plan (2023–2032) for central and state transmission systems has been finalised to meet a projected peak demand of 458 gigawatts (GW) by 2032. The plan involves an estimated investment of ₹9.15 lakh crore. During the previous plan period (2017–2022), about 17,700 ckm of transmission lines and 73 GVA of transformation capacity were added each year. Under the new plan, the transmission network will expand from 5 lakh ckm in January 2026 to 6.48 lakh ckm by 2032. Over the same period, transformation capacity will increase from 1,407 GVA to 2,345 GVA, and inter-regional transfer capacity will rise from 120 GW to 168 GW.*

04. Ports Infrastructure

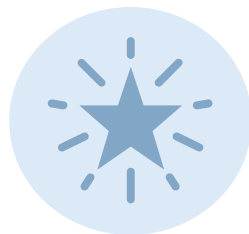


Indian Ports Industry Overview : Building Strength and Scale

Quick Facts



Approximately 95% of the country's trade by volume and 70% by value is moved through Maritime transport. Shipping continues to remain the world's most efficient means of transportation



Two Indian ports now feature among the top 30 and seven among the top 100 in the World Bank's Container Port Performance Index 2024 reflecting, India's growing competitiveness in maritime sector.



The number of PPP projects awarded in ports sector rose from 37 in FY15 to 87 in FY25, with the total value of PPP projects reflecting a 377% rise.



Currently, 57 operational PPP projects valued at Rs 42,235 crore have increased port capacity by approximately 660 MTPA.

Operational Excellence Meets Energy Transition



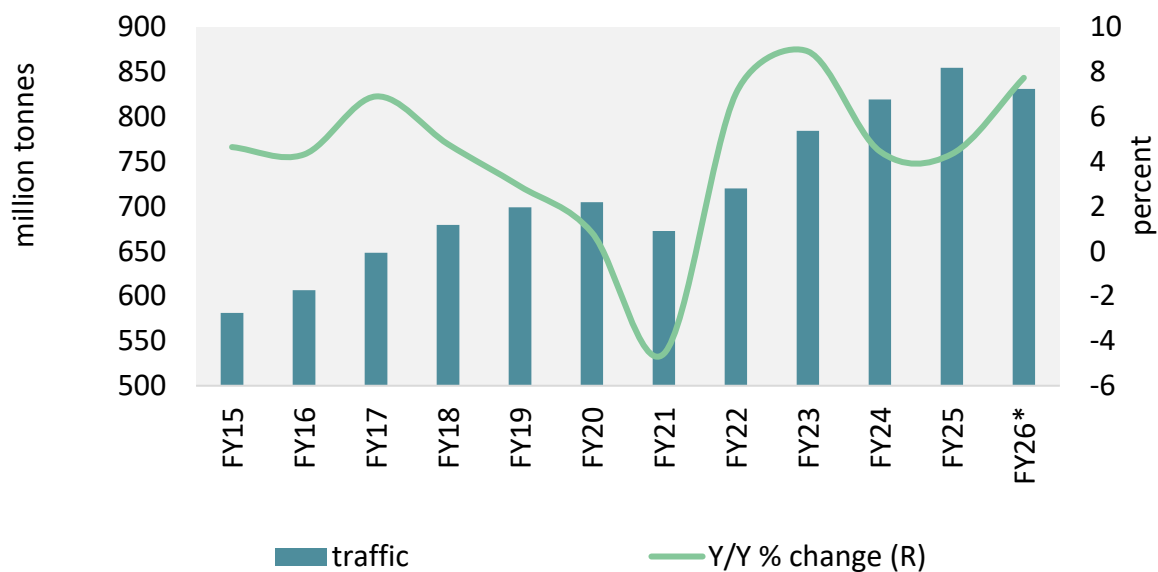
For the first time in the history of Major Ports, the Paradip Port Authority (PPA) and Deendayal Port Authority (DPA) surpassed the 150-million-tonne cargo handling mark, Meanwhile, Jawaharlal Nehru Port Authority (JNPA) set a record by handling 7.3 million TEUs.

The Ministry of New and Renewable Energy (MNRE) has recognised three Major Ports i.e. Deendayal Port Authority in Gujarat, Paradip Port Authority in Odisha, and V.O. Chidambaranar Port Authority in Tamil Nadu as Green Hydrogen Hubs to support the development of the green hydrogen ecosystem in the country under National Green Hydrogen Mission

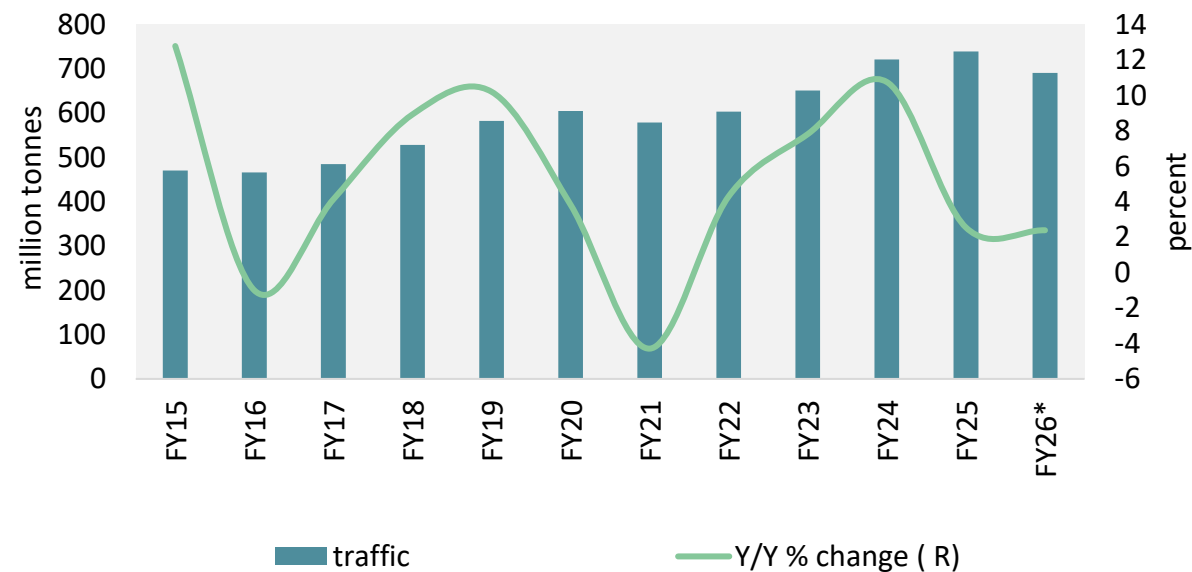
India Ports industry : The Evolution of Cargo Traffic and Transshipments

- In FY25, Major Ports delivered an impressive growth rate of 4.3% (y/y) in cargo handling, increasing from 819 million tonnes in FY24 to ~855 million tonnes in FY25. The increase in traffic was driven by higher container throughput (10%), fertilizer cargo handling (13%), POL cargo handling (3%), and handling of miscellaneous commodities (31%) compared to FY24. In the first 11 months of FY26 (uptil feb'26), cargo traffic stood at an impressive ~831 million tonnes.
- Among commodities handled at Major Ports, Petroleum, Oil, and Lubricants (POL) including crude, petroleum products, and LPG/LNG led the charts with a volume of 254.5 million tonnes (29.8%), followed by container traffic at 193.5 million tonnes (22.6%), coal at 186.6 million tonnes (21.8%), and other cargo categories such as iron ore, pellets, fertilizers, and more in FY 2024-25.
- Cargo traffic at minor ports grew 1.6X by reaching ~740 million tonnes in FY25 from 470 million tonnes in FY15. In the first 11 months of FY26 (uptil feb'26), cargo traffic stood at an impressive ~691 million tonnes.

Cargo traffic at Major ports



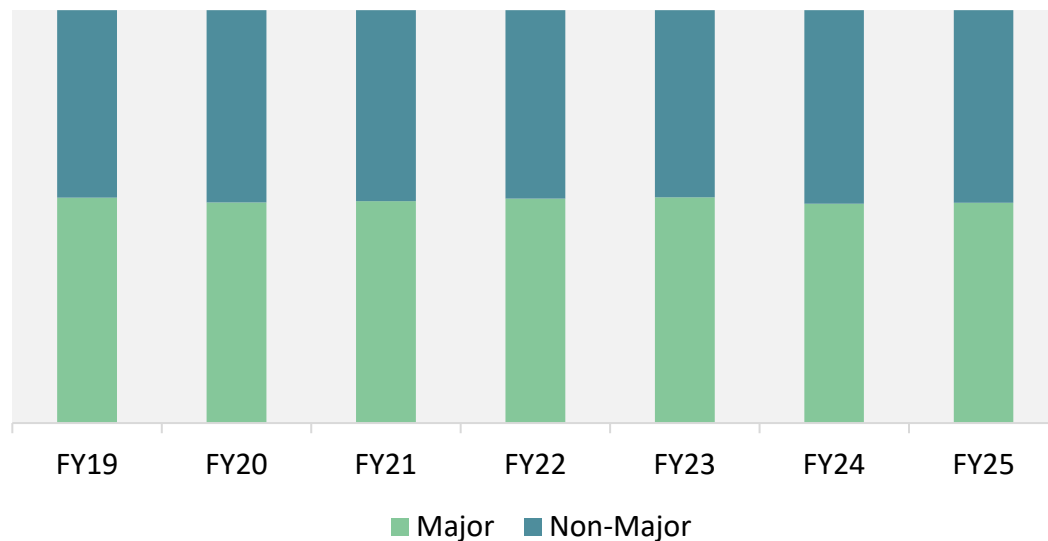
Cargo traffic at Minor ports



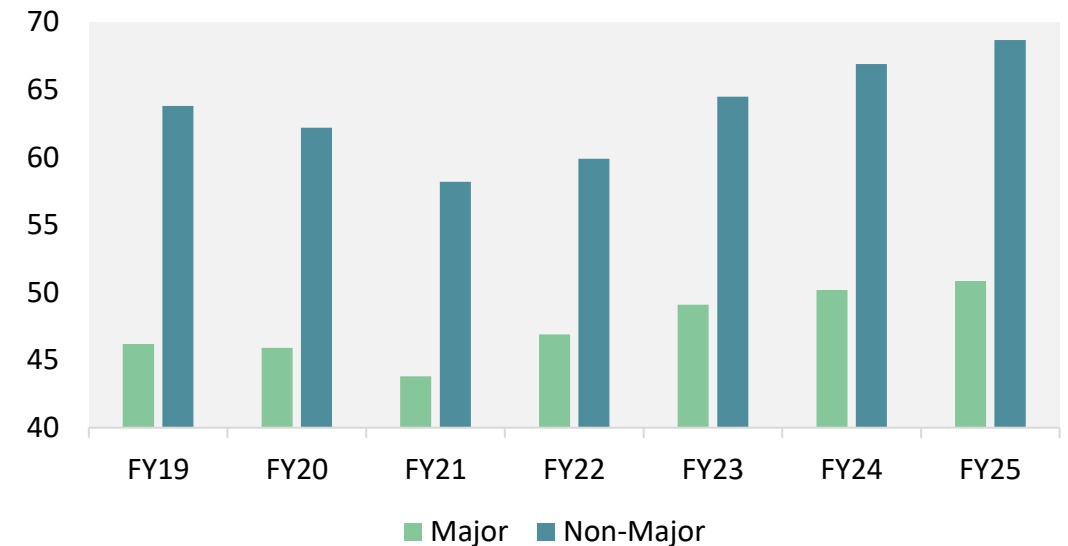
India Ports industry : Traffic Share Gains & Capacity Utilization Trends

- The share of non-major ports in India has remained consistent, hovering around 45% - 47% over the past few years. Driven by modernization, mechanization, and the development of inland waterways, this share is expected to rise, with projections indicating a potential increase to around 50% by FY28 or in the coming years
- The capacity utilisation of major ports increased to 51% from 46% in FY20. Meanwhile, minor ports has increased from 62% to 69% over the same period.
- In terms of capacity utilization, amongst major ports, Mumbai utilized ~79%, followed by Haldia port utilizing ~69% of its capacities whereas Murmugao utilizes only ~29% of its capacity. (as of FY25). Wide variations are observed for minor ports as well. Gujarat and Odisha ports utilize ~82% and 74% of their capacity respectively whereas Lakshadweep utilize a little over 2%.

Share of Major and Non-major ports in overall traffic



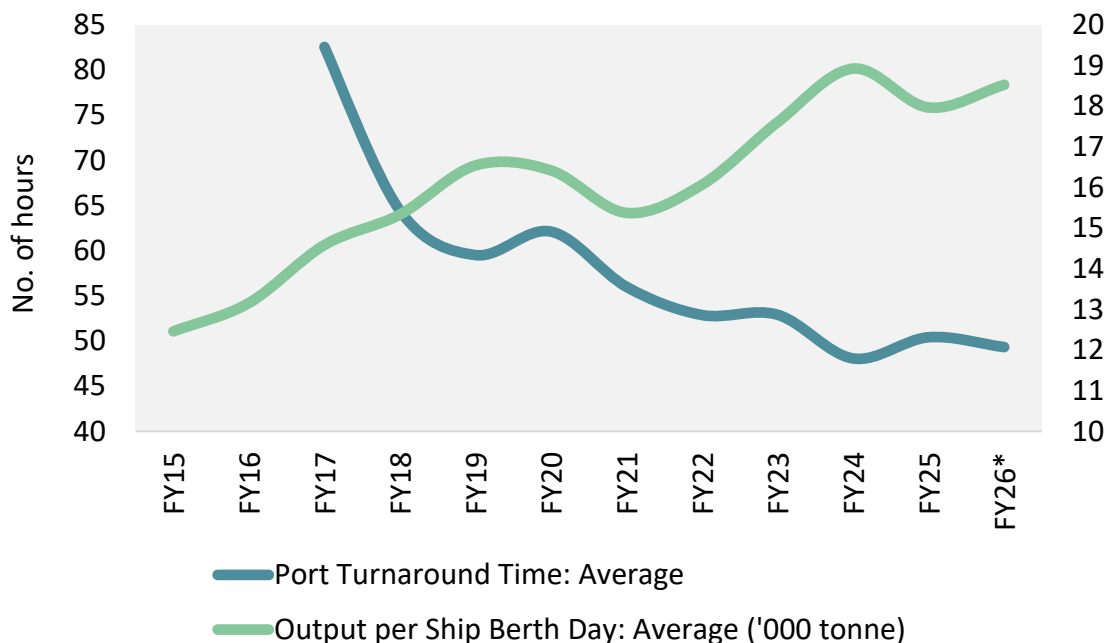
Capacity Utilization of Major and non major ports



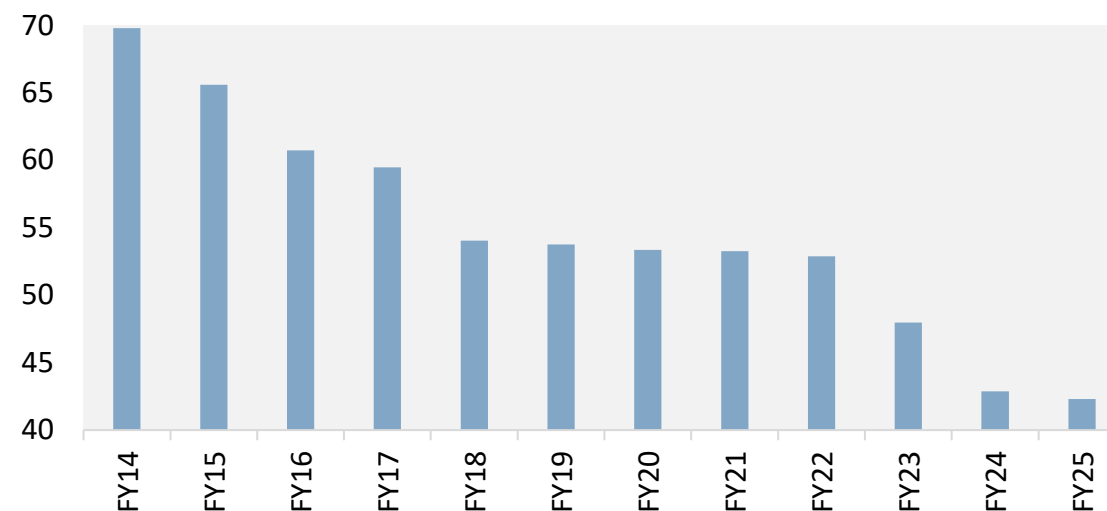
Major Ports: Physical & Financial Performance Snapshot

- Major advancements reflect enhanced cargo handling processes, upgrading of infrastructure, and introduction of mechanization initiatives. Average Turnaround Time (TRT) improved by 48%, reducing from 96 hours in FY 2014-15 to 49.5 hours in FY 2024-25. Idle Time (%) dropped by ~29%, from 23.1% in FY 2014-15 to 16.3% in FY 2024-25.
- Major Ports' financial performance has been equally impressive, with total income more than doubling over the past decade from Rs 11,760 crore in FY15 to Rs 24,203 crore in FY25, registering a 7.5% CAGR over 10 years. Operating surplus nearly tripled to Rs 12,314 crore, driven by a 13% CAGR over the same period. Operational efficiency also improved significantly, with the operating ratio declining from 64.7% in FY 2014-15 to 42.3% in FY 2024-25, reinforcing the ports' financial sustainability.

Physical Performance indicators



Ports: Major: Operating Ratio



* Till Dec'25 , Latest data available in Annual report FY25 MoPSW, CMIE, NaBFID Economist

India Ports industry : Amrit Kaal 2047, Government of India's Vision for Maritime Sector

Key 'Infrastructure' Development Themes



Develop World Class next generation Ports (Green Maritime) (Terminals / Berths / Alternate fuel systems and Lead The World In Safe, Sustainable & Green Maritime Sector.



Promote Maritime Clusters (Industrial clusters which are export oriented)



Global Player in Shipbuilding, Repair (MRO) & Ship Breaking.



Enhance modal share of Coastal shipping & Inland Waterways (Improve Rail / Road connectivity from hinterland to Ports).

Planned Investments and Financing Programme

Sl.No.	Intervention	Investments (Rs Lakh crores)
1.	<i>Port Modernization</i>	<i>35</i>
2.	<i>Shipbuilding and Ship repair</i>	<i>18</i>
3.	<i>Green shipping & Sustainability</i>	<i>10</i>
4.	<i>Inland Waterways & Coastal Connectivity</i>	<i>8</i>
5.	<i>Digital & Smart Maritime Ecosystem</i>	<i>4</i>
6.	<i>Cruise Tourism & Maritime Services</i>	<i>3</i>
7.	<i>Training, Research & Institutional Development</i>	<i>2</i>
	Total	~80 lakh cr (Debt = Rs 50 lakh cr + Equity = Rs 30 lakh cr)

India Ports industry : Progress made in flagship Sagarmala programme

- Sagarmala Programme envisages 839 projects with a total estimated investment of about Rs. 5.79 lakh crore by 2035. Under this programme, 315 projects have been completed, 210 projects are under implementation, and 320 projects are in the planning stage. (as of Mar'26)
- Additionally, 120 port modernization projects have been completed adding to new port capacity of more than 400 MTPA, while 106 completed projects of road and rail connectivity have strengthened cargo evacuation efficiency.
- These interventions have resulted in an increase of coastal shipping cargo to 195 MTPA from 87 MTPA (118%), inland waterway cargo to 145.50 MTPA from 18.10 MTPA (700%) and reduction in logistics cost by shift of freight to waterways.
- The program has estimated a cumulative employment potential of 1 crore new jobs, comprising 40 lakh direct and 60 lakh indirect roles

Progress of the Projects under Sagarmala Programme (as of Dec 31st, 2025)

Sl.No.	Pillars	Total		Completed		Under implementation		Under development	
		No. Of Project	Cost (Rs Cr)	No. Of Project	Cost (Rs Cr)	No. Of Project	Cost (Rs Cr)	No. Of Project	Cost (Rs Cr)
1.	Port Modernization	234	291279	106	35423	53	71956	75	183900
2.	Port Connectivity	279	206373	96	58628	52	67378	131	80366
3.	Port led Industrialization	14	55737	9	45865	3	9247	2	625
4.	Coastal Community Development	81	11573	23	1997	32	5875	26	3701
5.	Coastal Shipping and IWT	231	14601	54	3137	63	4768	114	6695
	Total	839	579562	288	145050	203	159225	348	275287

Indian Ports Sector : The Road Ahead



Targets

PPP and captive operators are projected to handle 80% of all cargo at major ports by 2030.



A pipeline of 48 PPP projects worth approximately Rs 23,000 crore has been identified from (FY26 to FY31) to further enhance the capacity and efficiency of India's Major Ports.



India aims to increase the Inland Water Transport modal share from 2% to 5% and raise cargo traffic to 200+ MMT by 2030 and 500 MMT by 2047 under the Maritime Amrit Kaal Vision.



River cruise tourism is growing steadily with 443 voyages in FY25 and 17 operational cruise circuits. New cruise terminals are planned at Varanasi, Patna, Guwahati, and Kolkata, alongside emerging cruise projects on the Yamuna, Chenab, Jhelum, and Mahanadi.



India will witness its first lighthouse museum in Andhra Pradesh that aims to showcase India's maritime heritage, evolution of lighthouse technology, and the history of marine navigation lighthouse tourism.



05. Railways Infrastructure

Indian Railways Overview : Inclusive Growth, Wider Reach, Better Quality

Quick glance at milestones achieved in 2025



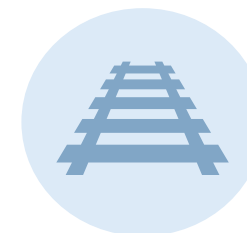
During the Calendar year-2025, Indian Railways introduced 15 Vande Bharat express trains, taking the total to 164 Vande Bharat train services running across the Indian Railways network.



Indian Railways has achieved remarkable progress in safety performance. Consequential Train Accidents during the period 2004-14 was 1711 (average 171 per annum), which has declined to 31 in FY25 and further to 11 in FY26. (upto Nov'25)



Indian Railways has taken a major step towards clean and sustainable energy by making 2,626 Railway stations solar-powered nationwide.



Two Dedicated Freight Corridors (DFC) viz. Eastern Dedicated Freight Corridor (EDFC) from Ludhiana to Sonnagar (1337 Km) and the Western Dedicated Freight Corridor (WDFC) from Jawaharlal Nehru Port Terminal (JNPT) to Dadri (1506 Km) have been commissioned and operationalized.



In FY26, Indian Railways achieved the historic milestone of 1 bn tonnes of freight loading, with daily loading touching 4.4 mn tonnes, driven by robust demand from coal, iron ore, cement, and container traffic.



Uptil 2025, 18 projects of Rs 16,686 crore have been completed through PPP model. 7 projects of Rs 16,362 crore are under implementation including coal connectivity and port connectivity projects.



As of March 2025, the rail network has expanded to 69,439 Rkm. During FY26, it is targeted to extend the network further by 3,500 km. Electrification has reached 99.1% of the network by October 2025.

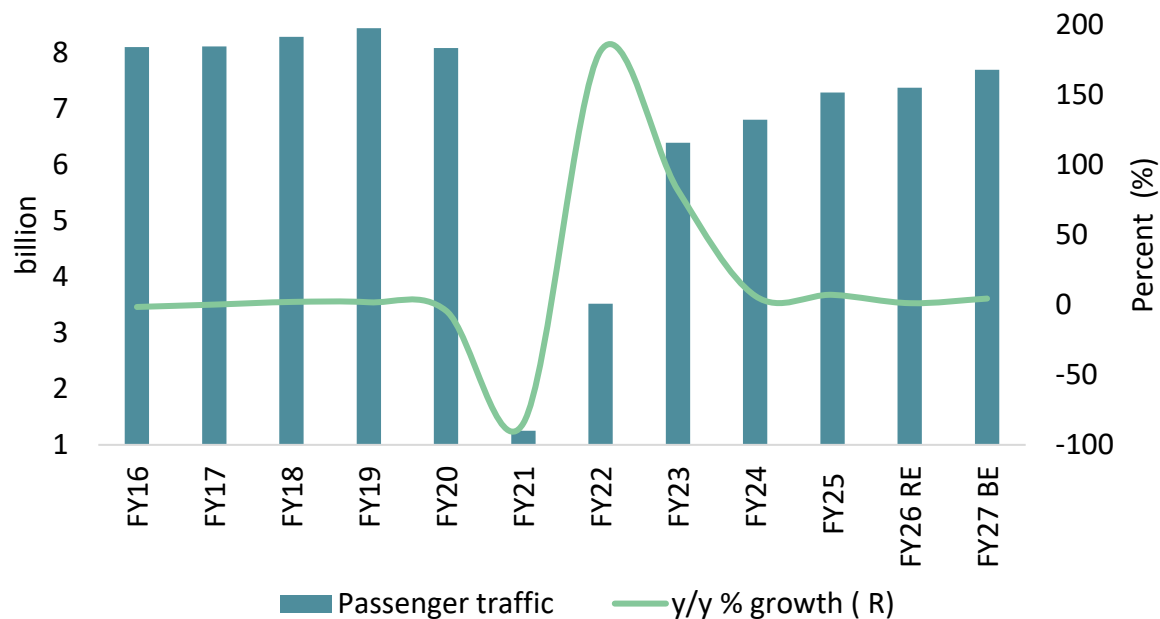


Sustained investments have enabled faster network expansion, with commissioning rates more than doubling in the post-2014 period (3118 between 2014-24) compared to the previous decade (1499).

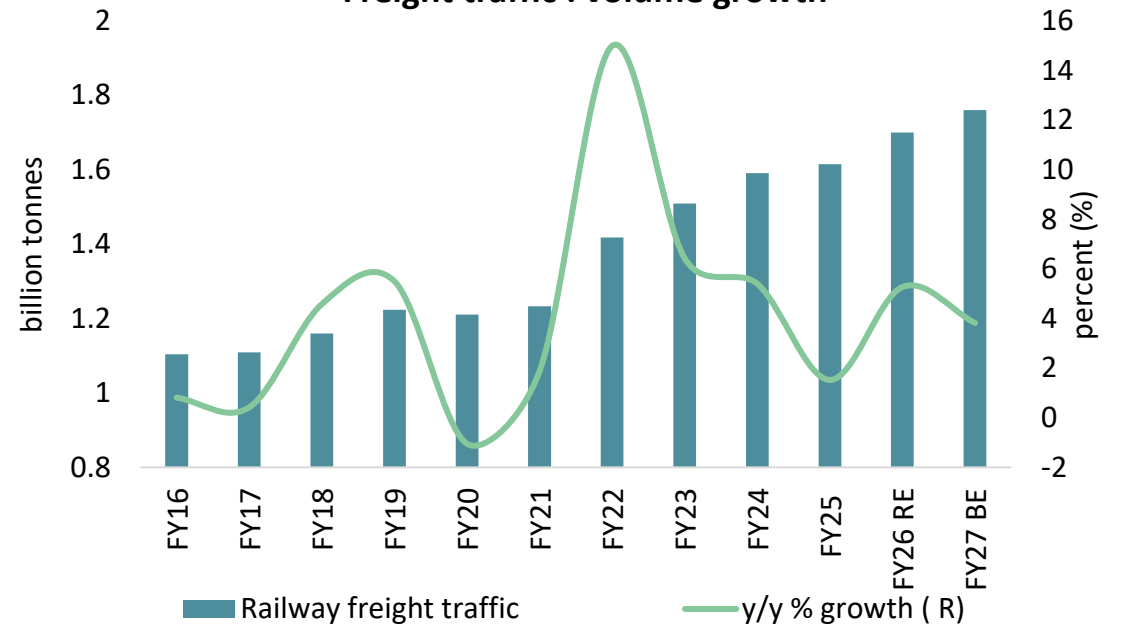
Indian Railways: : A snapshot of the demand for rail transport in India

- The passenger traffic for FY27 has been budgeted at around 7.7 bn travellers. In FY26, (RE) the traffic stood at 7.4 bn passengers, slightly lower than FY26 BE of 7.5 bn, delivering a growth of 1.2% (y/y) (FY26 RE over FY25). The passenger traffic (between FY16 to FY26) has consistently remained above ~6 bn (barring FY21-FY22) for the past 10 years.
- The freight traffic in FY26 RE stood at 1.7 bn tonne delivering an annual growth rate of ~5% (y/y) over FY25. It has consistently remained above the 1.1 bn tonne mark every year beginning FY16, unshaken even during the covid period. Coal has continued to dominate (~50%) the composition of freight traffic, followed by iron ore (~11%), cement (~10%), other goods (7%), pig iron and finished steel (~6%).
- During the calendar year-2025, 13 Amrit Bharat Express trains have been introduced and are operational. A total of 30 Amrit Bharat train services are running across the Indian Railways network. First Vande Bharat sleeper is all set to be operational soon.

Passenger traffic : Volume growth



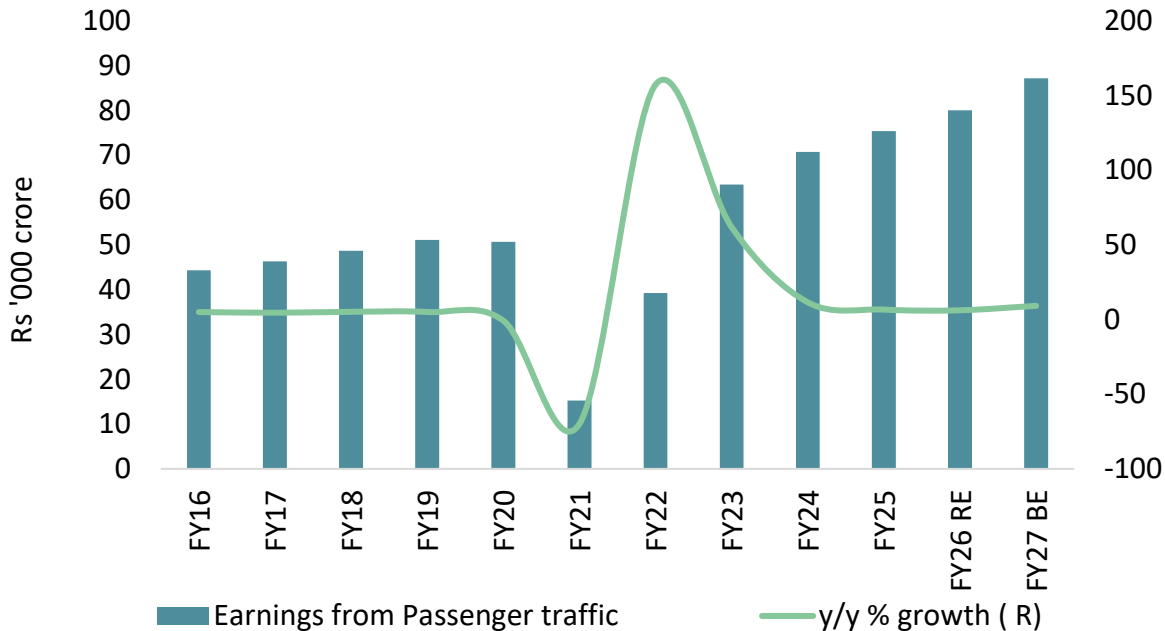
Freight traffic : volume growth



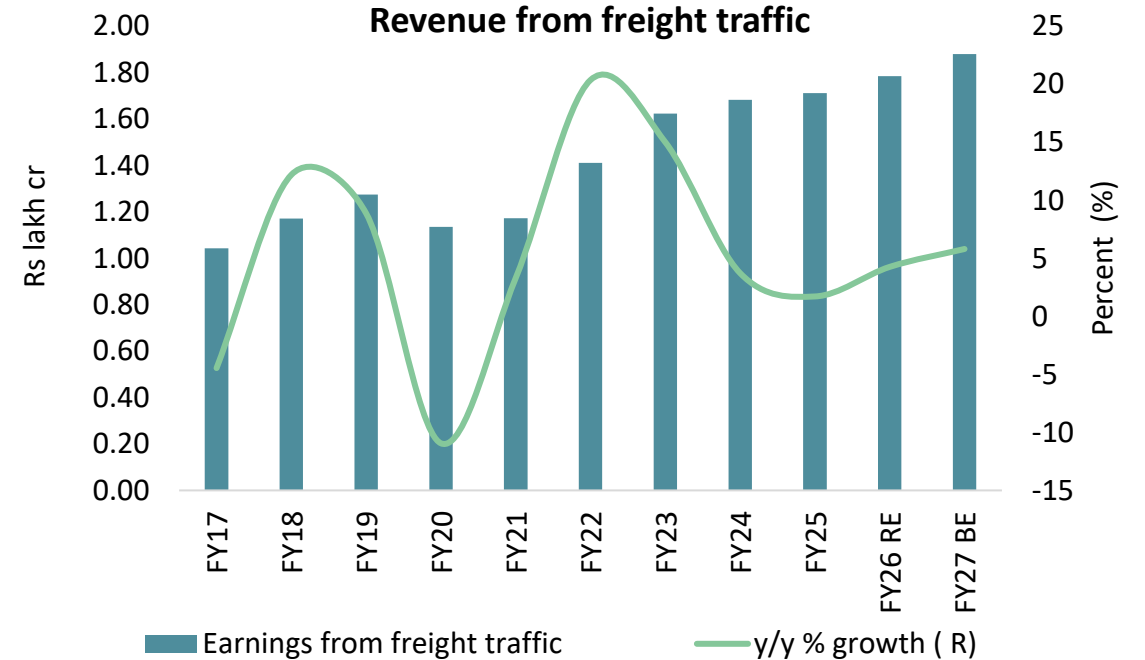
Indian Railways: A Decade of Revenue Growth, an In-Depth Analysis

- The Indian railways has pegged revenue collection from passenger traffic at ~Rs 87,000 cr in FY27. The actuals realized as per FY26 RE stood at Rs 80,000 cr exhibiting ~6% (y/y) growth over FY25 actuals. The CAGR (Compound Annual Growth Rate) of revenue earnings stood at 6% (between FY16 to FY26 RE) from passenger traffic in the past 10 years.
- Meanwhile, The Indian railways has pegged revenue collection from freight traffic at Rs 1.9 lakh cr in FY27 BE, similar to last year projections. Revenue from freight in FY26 RE exhibited a ~4.3% (y/y) growth from previous year. The CAGR of freight earnings stood at 5% (between FY16 to FY26 RE) in the past 10 years.
- Overall, the Indian Railways earned Rs 75,367 crore from the passenger segment in FY25, up 6% (y/y) from Rs 70,693 in FY24. The railways' FY25 earnings from freight services rose 1.7% to Rs 1.71 lakh crore from a total goods revenue of Rs 1.68 lakh crore in the year-ago period.

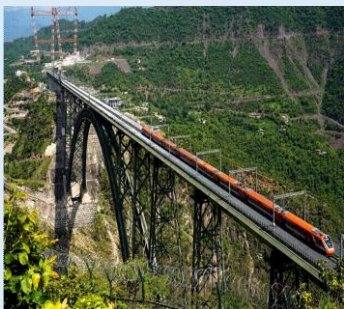
Revenue from passenger traffic



Revenue from freight traffic

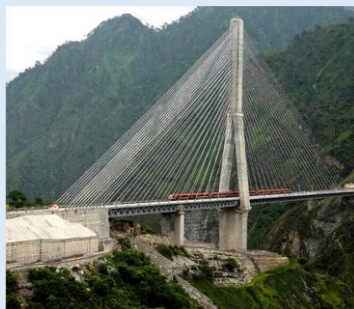


Indian Railways: Engineering Marvels - Transforming Travel and Economic Activity



Chenab Rail Bridge

- **World's highest railway arch bridge.**
- It stands **359 m above the river**, higher than the Eiffel Tower.
- It is a **1,315 m long steel arch bridge** engineered to withstand seismic and wind conditions.



Anji Rail Bridge

- India's **first cable-stayed railway bridge** over Anji river.
- **36 tunnels (spanning 119 km)** and 943 bridges are part of the project.
- provides **all-weather rail connectivity to the Kashmir Valley.**



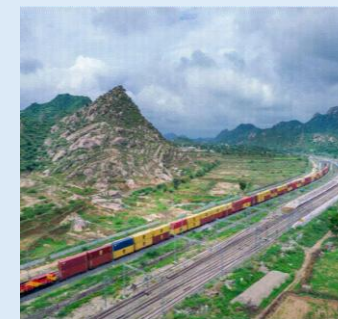
Pamban Rail Bridge

- India's **first vertical-lift sea bridge**, built at a cost of about ₹550 crore.
- Its corrosion protection system can **extend bridge's service life up to 38 years without maintenance & up to 58 years with minimal maintenance.**



Bridge No. 144 (of Bairabi-Sairang Rail Line)

- **42m taller than Qutub Minar.**
- connected **Aizawl to the rail network for the first time.**
- Since 2014, the Northeast has added >1,679 km of railway tracks, built more than 470 road over/under bridges.



Dedicated Freight Corridor

- Together the two corridors (Eastern +Western DFC) cover a total length of 2,843 km.
- As of Mar'26, entire 2,843 route kilometres have been commissioned, making up about 100% of total length.



Viaduct in Surat district, part of the Mumbai-Ahmedabad Bullet Train project

- As of 21 Dec,'25, 331 km of viaduct work is complete out of total 508 km alignment.
- will bring world-class high-speed rail technology to India.
- sharply reduce travel time between two major economic hubs.



06. Road Infrastructure

Indian Roads sector: Scale, Speed, and Structural Shifts

Quick Facts and major developments in 2025



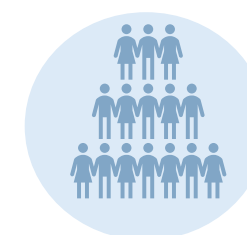
India has the world's second-largest road network, of ~63.74 lakh km, with National Highways spanning 1,46,572 km, forming the country's primary arterial network.



Every one-rupee expenditure in National Highway development leads to a Rs 3.2 increase in Gross Domestic Product (GDP)



Construction of 1 lane-km of National Highway leads to direct employment generation of 4,478 person-days and indirect employment generation of 5,297 person-days.



The long-term impact of highway construction leads to an induced employment generation of 52,393 person-days per lane-km over a period of 7 years driven by the increased economic activity in the region.



The capex undertaken by NHA in FY26 for development of National Highway infrastructure was ~2.5% higher (+ Rs 5,978 crore) than the Government Budgetary Support for FY26. The differential amount was met through NHA's own resources.



Government has constructed 57,125 km of NHs during last 5 years with avg. construction of 34,215 lane-km of NHs per year. This leads to average annual employment generation of about 33 Crore person-days including direct & indirect employment.



Government has targeted to operationalize 18,000 km of Access Controlled National HSCs/ Expressways by 2028-29.

Also, total 26,000 km of Access Controlled National HSCs / Expressways are targeted for award by 2032-33.

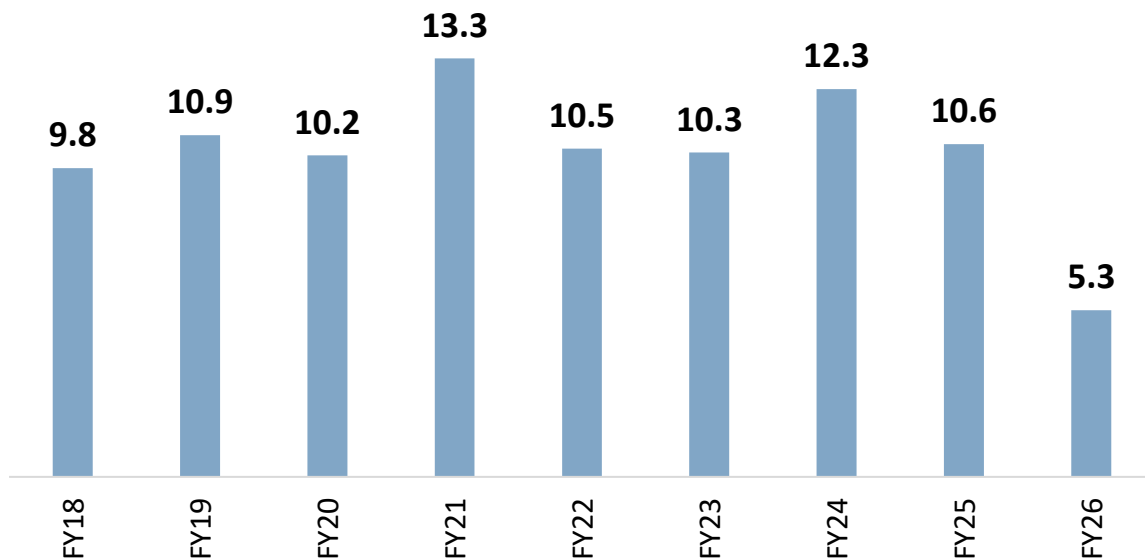


With the objective to provide a quantitative assessment of the plantations along the National Highways, NHA has released the first-of-its-kind Annual Report on the National Highways Green Cover Index (NH-GCI) 2025-26.

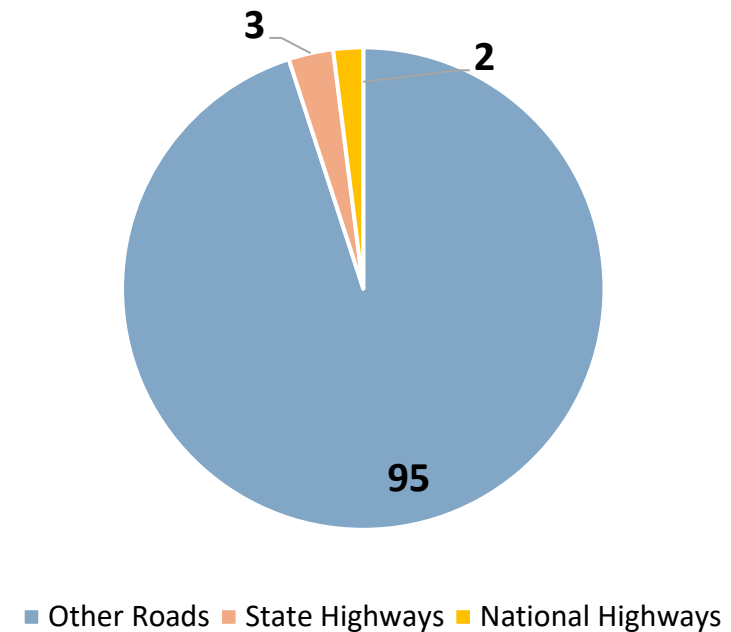
Indian Roads sector : Momentum Building Through Scale and Transformation

- The National Highway network length in the country has increased from 91,287 km in March 2014 to 1,46,572 km at present, recording a robust growth of about 60%, (as of Dec'25).
- At Present, out of 1.46 lakh km, ~34,000 km is under development, 59,000 km length under DLP/Concession period, and 47,000 km length under maintenance. The balance length is planned to be brought under maintenance contracts.
- The length of operational Access Controlled National High-Speed Corridors (HSCs) / Expressways has increased from 93 km in 2014 to 3,052 km at present. Length of 4 lane and above NH network (including Access controlled HSCs / Expressways) has increased by 2.6 times from 18,371 km in 2014 to 48,568 km at present. Also, proportion of less than 2-lane NHs has decreased from 30% in 2014 to 9% of the total NH network.

National highways constructed ('000 kms)



Share in total road network



India Roads sector : Progress made in flagship Bharatmala programme

- Total aggregate length of 26,425 km with a total capital cost of Rs. 8,53,656 crore have been approved and awarded till date under Bharatmala Pariyojana (including 6,758 km length of residual NHDP (National Highways Development Project). No further projects are now being taken up under Bharatmala Pariyojana.
- Access-controlled National HSCs / Expressways in about 9,750 km length have been awarded so far and, additionally, about 600 km has already been approved. Out of this about 6,000 km has been constructed. Total 3,052 km length has already been operationalized.

Status of Various components of Bharatmala Pariyojana (as of 31st Dec'25)

Component	Length awarded (km)	Length completed (km)
<i>Economic Corridors</i>	8,737	6,975
<i>Inter-corridors Roads</i>	2,889	2,409
<i>Feeder Roads</i>	973	707
<i>National Corridors</i>	1,777	1,530
<i>National Corridor efficiency improvement</i>	824	769
<i>Expressways</i>	2,422	2,013
<i>Border roads & international Connectivity roads</i>	1,619	1,469
<i>Coastal Roads</i>	77	72
<i>Port connectivity roads</i>	348	157
<i>Balance road works under NHDP</i>	6,758	5,684
Total- Bharatmala	26,425	21,785

State/UT-wise details of Expressways/ Access controlled Corridors operationalized

State/UT	Operational Length of Access-controlled/ National HSCs / Expressways (km)
<i>Delhi</i>	85
<i>Gujarat</i>	348
<i>Haryana</i>	645
<i>Karnataka</i>	151
<i>Madhya Pradesh</i>	360
<i>Rajasthan</i>	1,156
<i>Telangana</i>	59
<i>Uttar Pradesh</i>	232
<i>Uttarakhand</i>	17
Total	3,052

India Roads sector : Progress made in flagship Bharatmala programme

- A network of 35 Multimodal Logistics Parks (MMLPs) is planned to be developed as approved by Cabinet Committee on Economic Affairs. Out of 35 approved MMLPs, 15 MMLP locations have been prioritized for development.
- These MMLPs shall serve as regional cargo aggregation and distribution hubs for various industrial and agricultural nodes, consumer hubs and EXIM gateways such as seaports with multimodal connectivity.
- In certain cases, the MMLPs are also being developed in tandem with the Inland Waterway Terminals under the Sagarmala Pariyojana to further reduce the cost of inland cargo movement at a much larger scale as compared to conventional road-based movement.
- All these MMLPs are being developed on PPP-DBFOT basis having Concession Period of 45 years. MMLPs will have facility for modal shift, Inland Container Depot (ICD), Container yard, Warehouses, Cold storage, Truck parking, Fuel pump, EV charging, Commercial area, trucker facilities, etc.

Status of MMLPs under Implementation

S. No.	Mode	MMLP	State	Location	Land (Acres)	Investment (Rs. cr.)
1.	EPC	<i>Jogighopa</i>	<i>Assam</i>	<i>Jogighopa</i>	190	694
2.	PPP	<i>Chennai</i>	<i>Tamil Nadu</i>	<i>Mappedu</i>	181	1,423
3.	PPP	<i>Indo-re</i>	<i>Madhya Pradesh</i>	<i>Pithampur</i>	255	1111
4.	PPP	<i>Bangalore</i>	<i>Karnataka</i>	<i>Dabbaspete</i>	400	1770
5.	EPC	<i>Jalna</i>	<i>Maharashtra</i>	<i>Jalna</i>	63	162.67

07. Shipbuilding



Indian Shipbuilding Industry Overview : Expediting Reforms, Enabling Expansion

Quick Facts



India holds <0.1% share in the global shipbuilding industry. The top three nations – China, South Korea and Japan - account for ~94% for the total market share by gross tonnage.



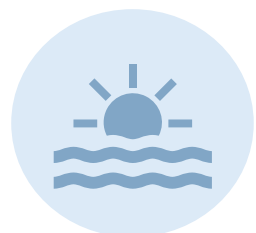
Presently, there are 79 Shipyards in the country, 7 under the Central Public Sector, 2 under State Governments and 70 under private sector.



The shipbuilding sector holds a high employment multiplier of 6.4 and a huge potential for generating both direct and indirect employment.



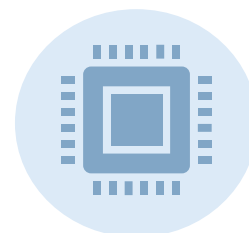
India is one of the leading destination for the recycling of end-of-life ships, accounting for 33% of global dismantling, Nearly 98% of ship recycling in India takes place at Alang–Sosiya in Gujarat.



Though India's share in global ship repair is currently <1%, the country is favourably located in respect of the major trade routes with 7-9% of the global trade passing within 300 NM of the coastline.



VOC Port has emerged as a leader in sustainable maritime operations after becoming the first Indian port to produce and use green hydrogen on-site.

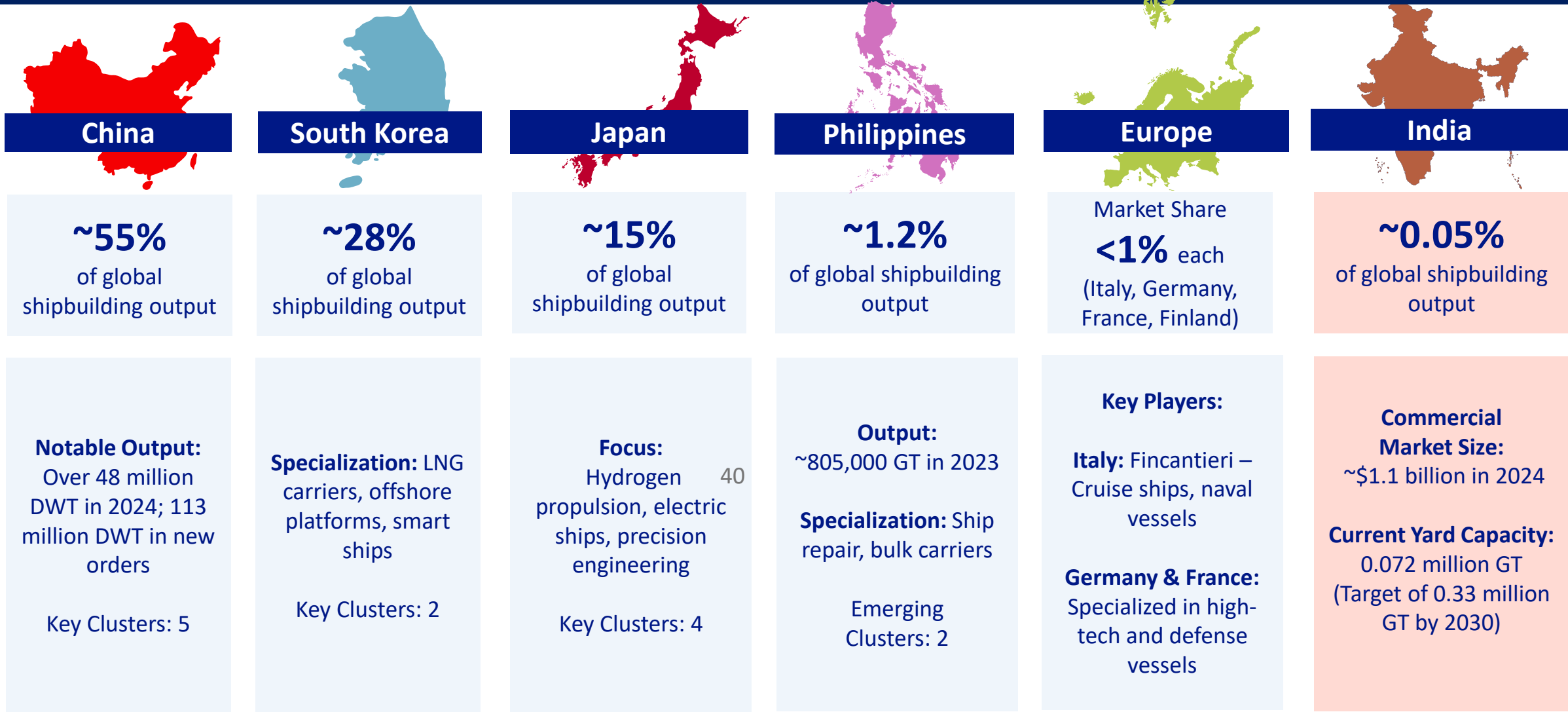


India's unveiled its first comprehensive Digital Twin platform at the VOC Port for real-time monitoring, predictive maintenance and data-driven optimization.



Aligned with Maritime India Vision 2030, 75 lighthouses with modern tourist facilities have been developed so far across 10 states/UTs, supporting broader shipbuilding ecosystem and maritime self-reliance.

India's Position in the Global Shipbuilding Industry

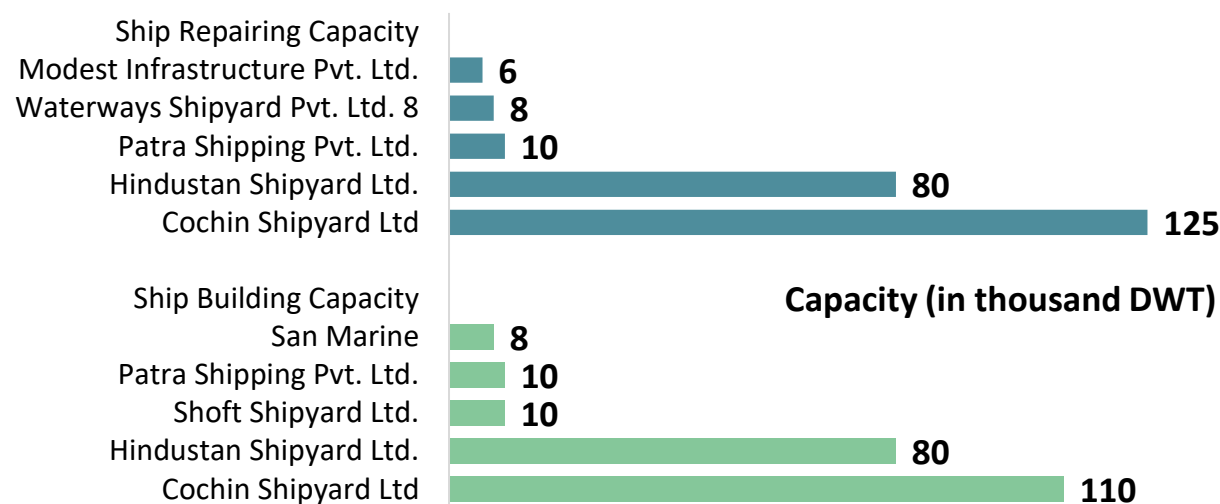


Need for India to build its capability and capture market share on a sustained basis.

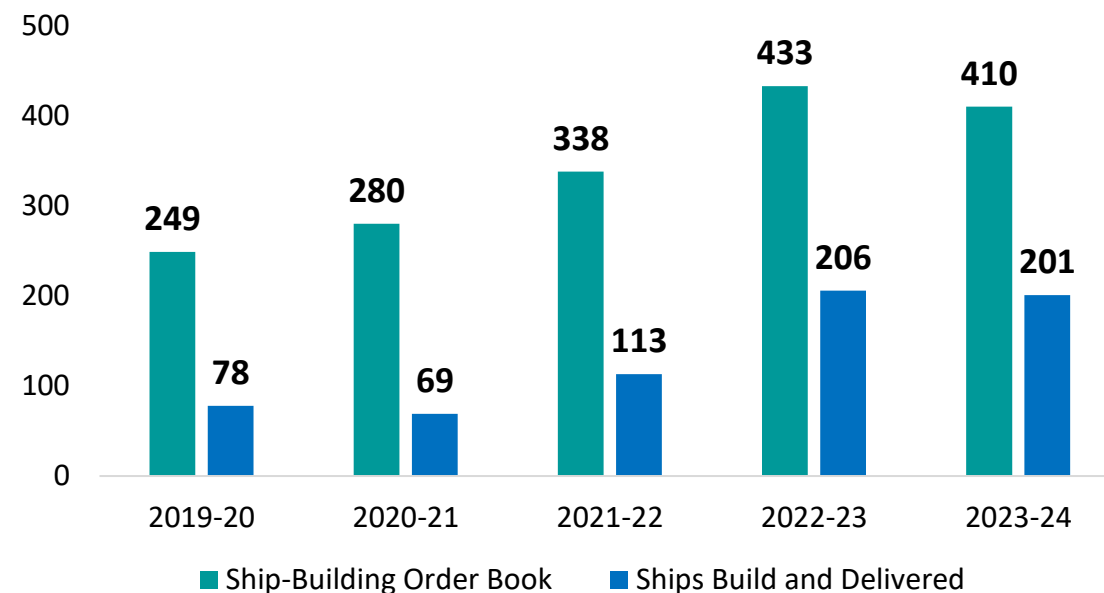
Indian Shipbuilding & Ship Repair: A Statistical Snapshot

- Amongst reporting public sector companies, Cochin Shipyard Ltd. (CSL) possess the maximum ship building capacity (110 thousand DWT) followed by Hindustan Shipyard Ltd. (HSL) (80 thousand DWT), Goa Shipyard Ltd. (GSL) (4.5 thousand DWT), Hooghly Cochin Shipyard Ltd. (HCSL) and Udupi Cochin Shipyard Ltd. (UCSL) (4.0 thousand DWT) each.
- Amongst the reporting private sector companies, Shoft Shipyard Pvt. Ltd. (SSPL) and Patra Shipping Pvt. Ltd. (PSPL) possess the maximum ship building capacity (10 thousand DWT) each followed by San Marine, Mandovi Drydocks Ltd. (MDD) and Waterways Shipyard Pvt. Ltd. (WSPL) (8 thousand DWT) each and Chowgule & Co. Ltd. (C&CL)
- In the current order book, out of total 410 ships, 168 are with public sector yards and 242 are with private sector yards amounting to 293.84 thousand DWT and 307.24 thousand DWT respectively.

Ship-Building and repairing capacity of top 5 reporting companies in 2023-24




Indian Shipbuilding Statistics



Indian Shipbuilding Industry : Progress of government's flagship Shipbuilding Financial Assistance Policy, 2016

- Under the Shipbuilding Financial Assistance Policy (SBFAP), a total of 288 contracts worth Rs 19,748 crore, covering 456 vessels, have received in-principle approval till date.
- The types of vessels covered include tugs, general cargo vessel, bulk carrier, oil tanker, crane pontoon, heavy deck cargo vessel, RO-RO pax vessel, crew boat, deck loading craft, coastal research vessel, modular pontoon, passenger catamaran, passenger cum motor cycle ferry, passenger ferry, landing craft, jack-up barge and self-elevating platform.
- As of now, total financial assistance amounting to Rs 620.57 crore has been disbursed to 23 shipyards for the construction and delivery of 204 vessels.

Shipping Reforms in 2025: Boosting Indigenous Capacity, Lowering Foreign Dependence

- 
- *The Merchant Shipping Act, 2025 has been enacted to modernize the legal framework, improve ease of doing business, and encourage Indian flagging of ships. Indian-flagged vessels are promoted through the Right of First Refusal (RoFR), simplified ship registration, and other regulatory reforms.*
 - *Shipping vessels, greater than a certain size, have been classified as infrastructure assets to enable easier access to finance.*
 - *Further, initiatives such as the Shipbuilding Financial Assistance Scheme, (SBFAS) has a budgetary outlay of Rs. 24,736 Crore up to 31st March 2036.*
 - *Shipbuilding Development Scheme (SbDS), with a budgetary outlay of Rs. 19,989 crore up to 31st March, 2036 focuses on long-term capacity and capability creation*
 - *Ship Breaking Credit Note and the Maritime Development Fund support the long-term financing needs of shipbuilding sector.*

Indian Shipbuilding Industry : Key Challenges



Infrastructure

External Infrastructure bottlenecks

Hinterland to terminal connectivity through rail/ road, water to reduce costs of transportation.

Modernization & Upgradation of Ports

To meet the rapid advancement and compete with international ports.

Waterways as a mode of cargo transport

Potential to be explored to remove connectivity constraints.

Digital & IT Platforms for Maritime Management

Potential to reduce cost and time to improve throughput of ports.



Vessels / Operations & Maintenance

Shipbuilding Ecosystem

Lack of strong ship building ecosystem with MSME and other support institutions, in one place.

Borrowing Costs & Terms

High borrowing costs with less attractive terms as compared to foreign counterparts.

Ageing Fleet & Compliances

Ageing fleet and compliance with international emissions norms requiring investments.

Dependence on Imports

For equipment / parts / material which leads to increasing turn around times.

Indian Shipbuilding Industry : The Road Ahead



Targets

Vision 2030 envisions Indian ship building to become competitive to reach “Make in India, Make for World” levels and be one of the top 10 shipbuilding nations in the world.

India’s annual ship repair market is estimated to be around Rs. 2,000 Cr., with an overall estimated potential of Rs. 6,000 Cr.



However, more than 30% of the commercial ship repair is conducted outside India catering this market. Nevertheless, over the next 10 years, India has the potential to create Rs. 14,000+ Cr.

With the creation of modern infrastructure and a skilled workforce, India’s commercial shipbuilding capacity is projected to rise to about 4.5 million gross tonnage per annum by 2047

Currently, the maximum size of the vessels, which can be built in India in the public sector is 1,10,000 Dead Weight Tonnage (DWT), projected to increase to build vessels up to 3,00,000 DWT by Cochin Shipyard Ltd.

A photograph of a hospital ward with several beds, medical equipment, and a window. The text '08. Social Infrastructure' is overlaid on the image.

08. Social Infrastructure

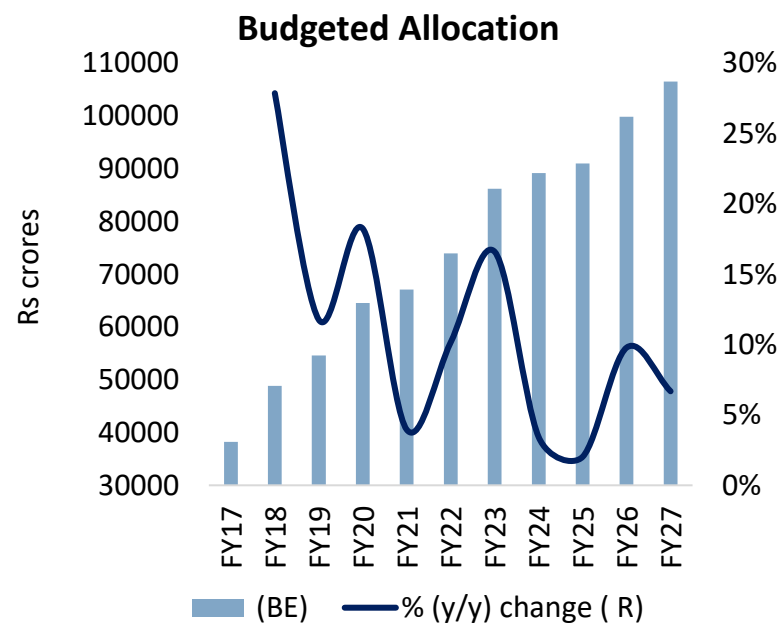
India's social infrastructure overview : Rising significance for inclusive development



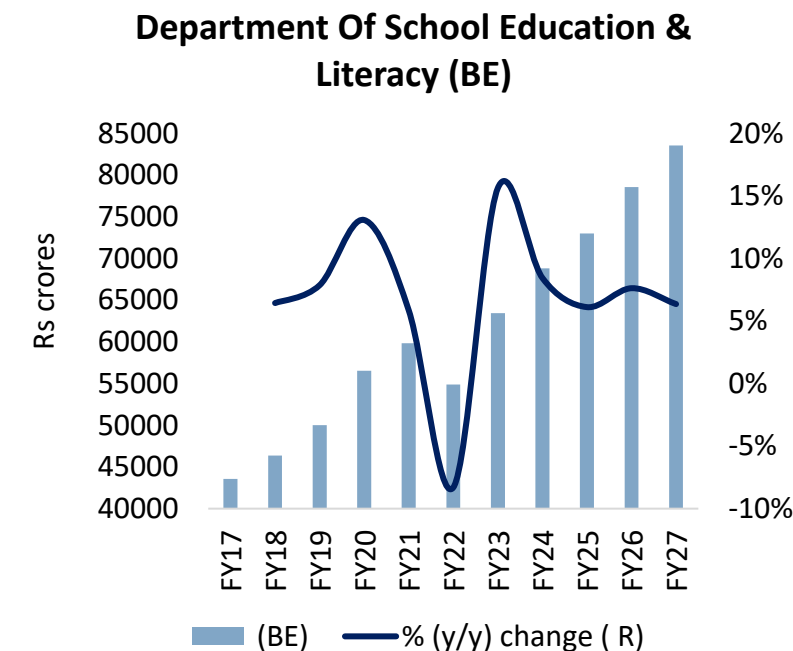
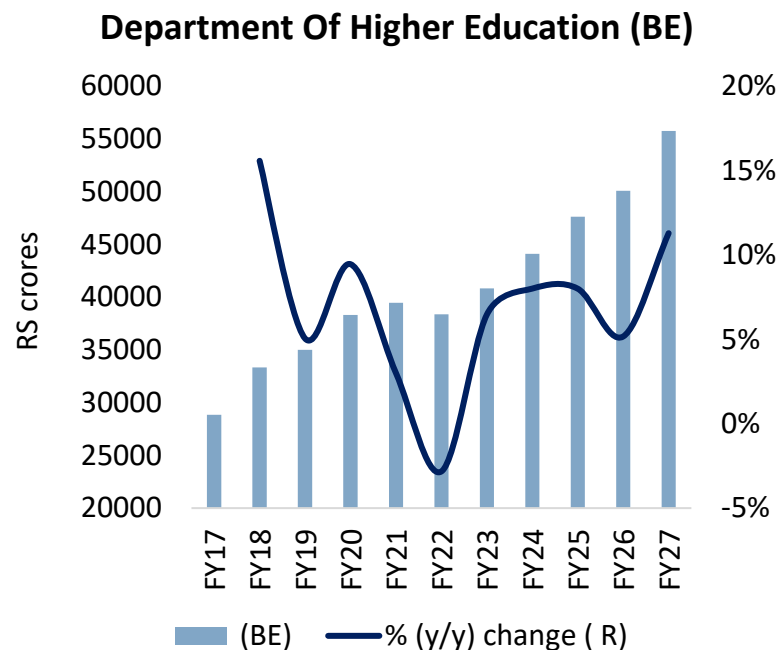
- For 2026-27, the Ministry of Health and Family Welfare has been allocated Rs 1,06,530.42 crore, representing an increase of about 10% over the revised estimates of the previous year. Crossing the Rs 1 lakh crore threshold is a notable fiscal milestone.
- The Budget allocations for Ministry of Health delivered a Compound Annual Growth rate of ~11% in the past decade (FY17-FY27)
- The Union Budget 2026-27 allocated a total of Rs 1,39,289.48 crore to the Ministry of Education, marking an 8.27% increase over the previous year, with a strong focus on skilling, AI integration, and STEM education.
- The Budget allocations for Ministry of Education delivered a Compound Annual Growth rate of ~7% in the past decade (FY17-FY27)

Analysing the Budgetary Allocations of Health and Education Over the years

Ministry of Health & Family welfare



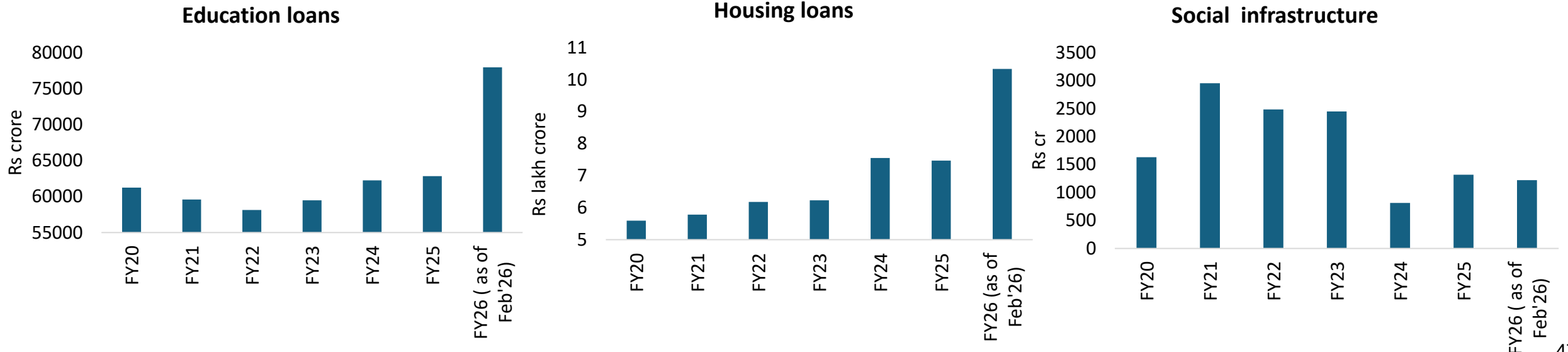
Ministry of Education



Financing social infrastructure : Trend analysis of credit flow

- The outstanding bank credit to education sector has grown at a Compound annual growth Rate of ~0.3 % in the last five years (from FY20-FY25) In FY26 (as of Feb'26), the total outstanding bank credit for education loans stood at Rs 77,935 crore.
- The outstanding bank credit to housing sector has grown at a Compound annual growth Rate of ~3 % in the last five years (from FY20-FY25) In FY26 (as of Feb'26), the total outstanding bank credit for housing stood at Rs 10.3 lakh crore.
- The outstanding bank credit to social infrastructure sector has decelerated at a Compound annual growth Rate of ~ (-) 2.1% in the last five years (from FY20-FY25) In FY26 (as of Feb'26), the total outstanding bank credit for social infrastructure stood at Rs 1,220 crore

Outstanding Bank credit to Priority sectors by Scheduled Commercial Banks



Note : *as of jan'25 Source: RBI data on sectoral deployment of credit, NaBFID Economist

■ Housing loans

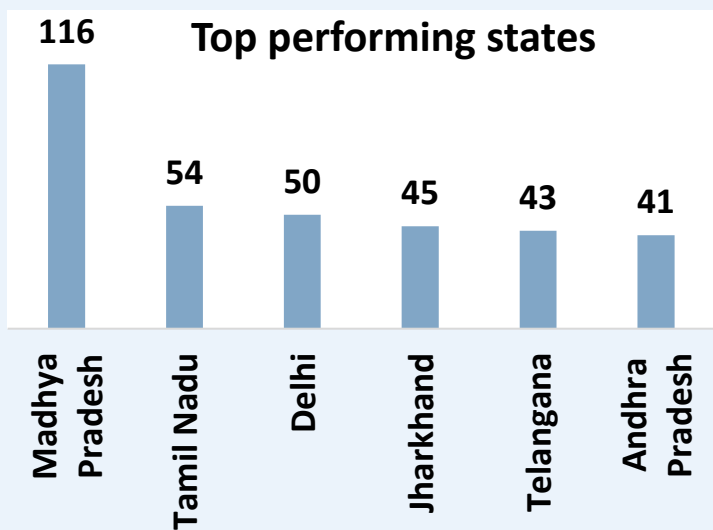
Analysing allocations of Various health initiatives undertaken over recently (in Rs crore)

Funding for the Ayushman Bharat Pradhan Mantri-Jan Arogya Yojana (AB-PMJAY), launched in 2018, has been steadily rising. As the world's largest public healthcare scheme, it provides health insurance of up to Rs. 5 lakhs annually per eligible household, making quality healthcare affordable for over 12 crore vulnerable families. Funding for other schemes has also increased over the decade, responding to India's evolving health landscape and demand for stronger healthcare infrastructure.

Central Sector schemes	FY27 BE	FY26 (RE)	Increase	Increase (%)
<i>Pradhan Mantri Jan Arogya Yojana (PM-JAY)</i>	9,500.00	9,000.00	500	5.56%
<i>National Health Mission (NHM)</i>	39,390.00	37,100.07	2,289.93	6.17%
<i>Pradhan Mantri Swasthya Suraksha Yojana (PMSSY)</i>	11,307.00	10,900.00	407	3.73%
<i>National AIDS and STD Control Programme</i>	3,477.00	2,661.50	815.5	30.64%
<i>Blood Transfusion Services</i>	275	200	75	37.50%
<i>Human Resources for Health & Medical Education</i>	1,725.00	1,630.00	95	5.83%
<i>Ayushman Bharat Digital Mission</i>	350	324.26	25.74	7.94%
<i>PM-Ayushman Bharat Health Infrastructure Mission (PM-ABHIM)</i>	4,770.00	2,845.00	1,925.00	67.66%
NON-SCHEME COMPONENT				
<i>AIIMS, New Delhi</i>	5,500.92	5,238.70	262.22	5.01%
<i>Central Government Health Scheme & Pensioners' Benefits</i>	8,697.86	8,106.96	590.9	7.29%
<i>Central Hospitals</i>	4,599.66	4,206.84	392.82	9.34%
<i>PGIMER, Chandigarh</i>	2,504.65	2,417.86	86.79	3.59%
<i>Indian Council of Medical Research (ICMR)</i>	4,000.00	3,150.50	850	26.98%

Analysing Opportunities in the Education infrastructure sector, Healthcare and Pharmaceuticals sector

Education Infrastructure



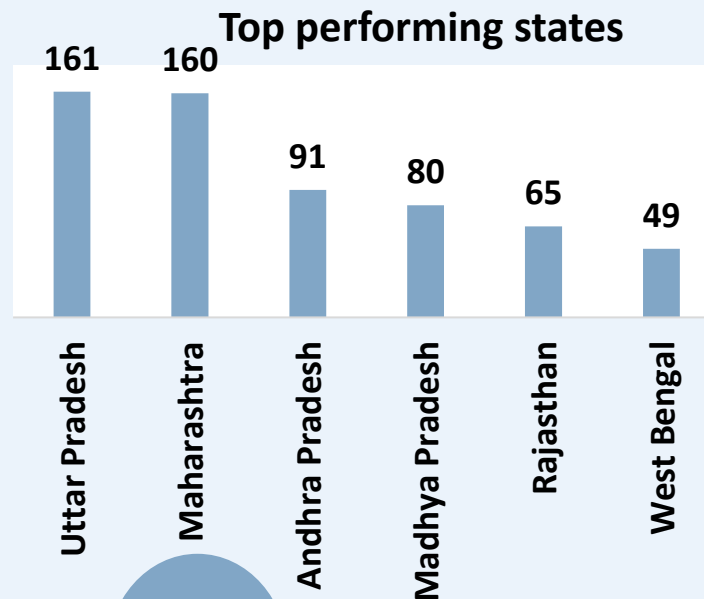
805 Opportunities worth

USD 31.4 bn

Mode of implementation

622 EPC 41 to be finalized 34 PPP 9 Pure private

Healthcare sector



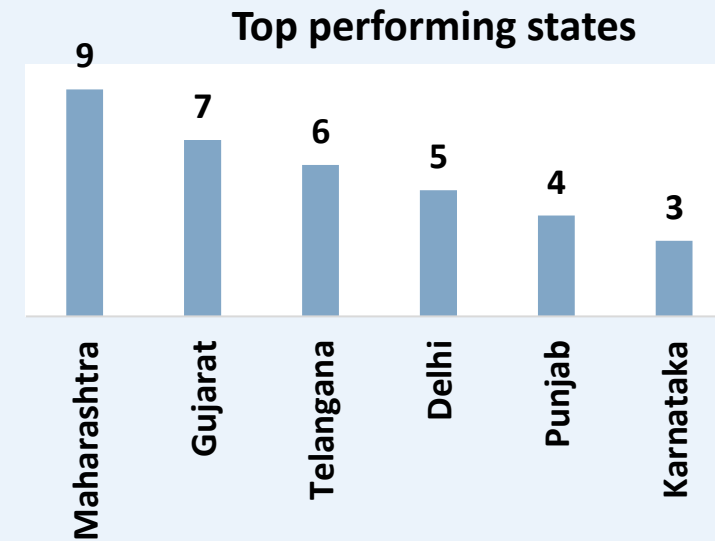
1154 Opportunities worth

USD 33 bn

Mode of implementation

1073 EPC 16 to be finalized 0 Pure private
6 Not disclosed 5 Others 54 PPP

Pharmaceuticals sector



50 Opportunities worth

USD 661 mn

Mode of implementation

2 EPC 0 to be finalized 1 PPP 0 Pure private

*as per India investment grid (as of April 6th 2026)



09. Telecommunication Infrastructure

Indian Telecom Industry Overview : propelling India into a new era of digital transformation

DoT makes significant strides in strengthening the Indian telecom ecosystem



- *In 2025, India became the 5th nation (joining South Korea, China, Sweden, and Finland) to build a fully home-grown 4G network stack, implying it no longer had to rely on foreign vendors for critical 4G technology, enhancing national security and boosting "Atmanirbhar Bharat".*
- *Previously dependent on foreign technology for telecom services like 2G, 3G, and 4G, India responded to the Covid-19 pandemic by building this fully indigenous 4G stack from scratch, demonstrating resilience, rapid innovation, and supply-chain independence. This achievement places India among five nations capable of launching fully homegrown 4G services, reinforcing the swadeshi spirit.*
- *Complementary government initiatives, including the Bharat 6G Alliance, 100 5G/6G labs, and the Telecom Technology Development Fund are advancing research and innovation, charting a path toward Viksit Bharat 2047 and global leadership in digital technology.*

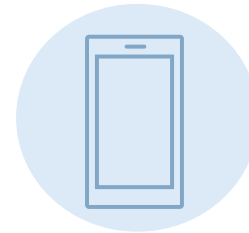
Quick Facts



India's telecom revolution over the past decade has reduced data costs by nearly 97% .



5G services have been rolled out in all States/ UTs across the country and are available in 99.9% of the districts in the country with a population coverage of 85%.



Internet connections crossed the milestone of 100 crore to reach 100.29 crore in 2025, as against 25.15 crore in March 2014, registering growth of ~ 299%



In India, Delhi Licensed Service area (LSA) has the maximum tele-density of ~360% while the Bihar LSA has the minimum tele-density of ~63% at the end of February 2026.

Indian Telecom Industry : Performance Metrics Witness Breakthrough Growth over the past decade

- Overall tele-density in India rose to 93% in February 2026, up from 75% in March 2014.
- Rural telephone connections grew 45%; nearly double of urban increase, rising from ~378 million in March 2014 to ~548 million in February 2026.

Highlights of Telecom Subscription Data at the end of February 2026

Particulars	Wireless	Wireline	Total (Wireless + Wireline)
Total Telephone Subscribers (Million)	1273.31	47.99	1321.31
Urban Telephone Subscribers (Million)	730.75	42.91	773.66
Share of Urban Subscribers (%)	57.39%	89.41%	58.55%
Rural Telephone Subscribers (Million)	542.56	5.08	547.65
Share of Rural Subscribers (%)	42.61%	10.59%	41.45%
Overall Tele-density (%)	89.30%	3.37%	92.66%
Urban Tele-density (%)	142.32%	8.36%	150.68%
Rural Tele-density (%)	59.46%	0.56%	60.02%
No. of Broadband Subscribers (Million)	1013.03	46.02	1059.05

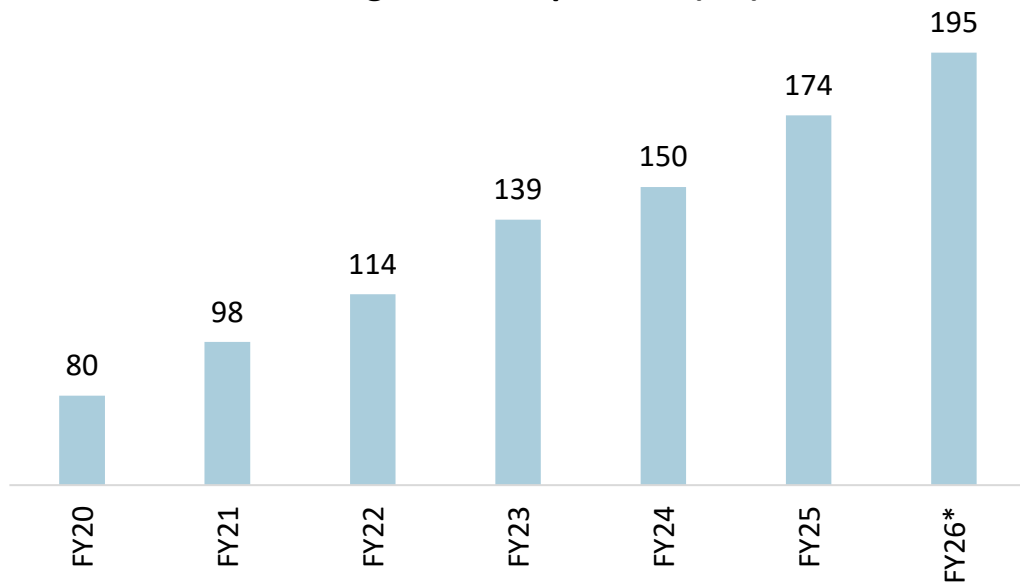
Market Share of Top 5 Broadband Service Providers

S.No	Service Provider	Subscriber base (million)	Market Share (%)
1.	Reliance Jio Infocomm Ltd.	519.64	49
2.	Bharti Airtel Ltd.	364.14	34
3.	Vodafone Idea Ltd.	129.36	12
4.	Bharat Sanchar Nigam Ltd.	28.7	3
5.	Atria Convergence Technologies Ltd.	2.38	1
	Total	1044.2	98.6

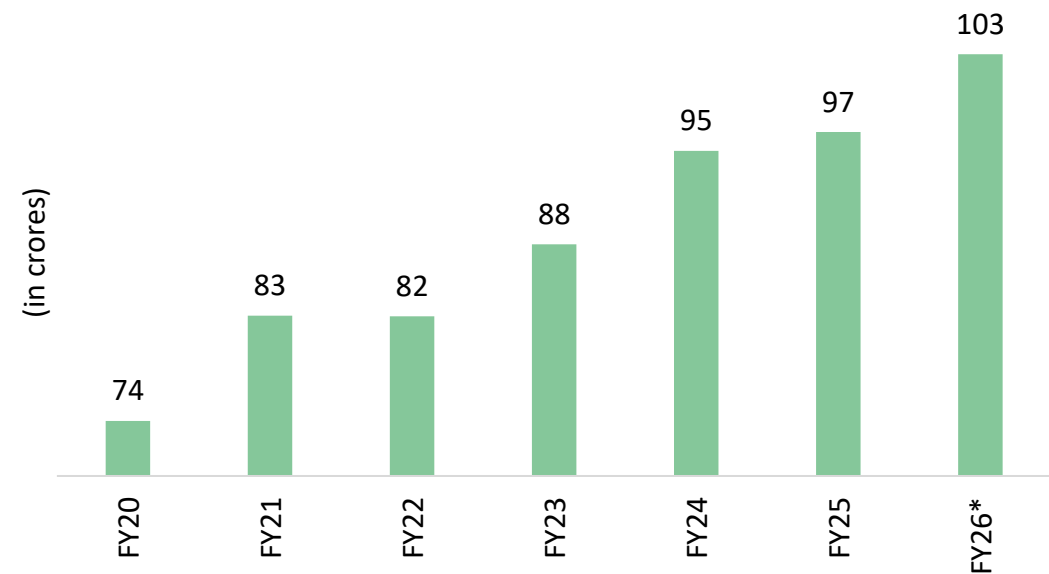
Indian Telecom industry : Analysing Financial performance and physical growth

- Internet connections crossed the milestone of 100 crore to reach 100.29 crore in Sep'25, as against 25.15 crore in March 2014, registering growth of 299%. As of Dec'25, the total base has grown further to ~103 cr reflecting Internet's growing penetration. Complementing this drive, major strides have been achieved in advancing indigenous 6G research and development under the ambitious Bharat 6G Mission.
- DoT also launched Sanchar Mitra 2.0 in 2025, a youth-oriented initiative aimed at harnessing the energy and potential of young students to raise public awareness about mobile safety, telecom fraud prevention, and about government digital initiatives.
- On the financial side, the average revenue per user grew ~2.4X standing at Rs 195 in FY26 (as of Dec'25) against Rs 80 in FY20, Between FY20 and FY25 the average revenue has delivered a healthy CAGR of ~17%.

Average revenue per user (Rs.)



Internet subscribers



Status of 5G Rollout : Progress tracking of Initiatives undertaken to Develop Indigenous 5G Ecosystem

Telecom Technology Development Fund (TTDF)

Aims to fund Research & Development (R&D) in communication technologies.

- *As on Feb'26, 136 R&D projects have been approved.*
- *Out of 136 projects, 104 projects are related to R&D in 6G technology, covering areas like 6G The test bed, transmitter module, cell free access points, RIS based hardware system, use of AI/ML in 6G etc.*
- *11 projects are approved under 5G technology covering areas like millimeter wave power amplifier, core development, Fully integrated transceiver etc*

6G Initiative:

Envisages India to be a frontline contributor in design, development and deployment of 6G technology by 2030.

- *Successful setting up of 'Bharat 6G Alliance' which is an alliance of domestic industry, academia, national research institutions and standards organizations to develop action plan according to the Bharat 6G Vision.*
- *signed MoU with leading global 6G alliance to enhance global collaborations for the development of 6G wireless technologies*

Indigenous 5G Test Bed :

Government approved a financial grant of Rs. 224 Crore in March 2018 to establish an 'Indigenous 5G Test Bed' in India,

- *The project involves 8 collaborating institutes working together on this initiative, including Indian Institute of Technology Madras, Indian Institute of Technology Delhi, Indian Institute of Technology Hyderabad, Indian Institute of Technology Bombay, Indian Institute of Technology Kanpur, Indian Institute of Science Bengaluru, Society for Applied Microwave Electronics Engineering & Research (SAMEER), and Centre of Excellence in Wireless Technology (CEWiT), Chennai.*

5G labs:

Government has setup 100 5G labs across the country with an outlay of Rs. 97.67 Cr.

- *These labs are utilized for development of 5G use cases/applications in various socio-economic sectors such as education, agriculture, health, power, urban management, mining, logistics, resource management, tourism, sports, security, e-governance, etc.*

Indian Telecom Industry at Saturation Point, Yet Growth Avenues Persist

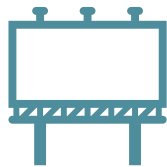
Beyond Saturation: Where India's Telecom Growth Truly Lies

- *Wireless Average Revenue Per User (ARPU) has stayed between Rs 180 to Rs 200 despite tariff hikes and 5G investments. Flat ARPU has emerged as a structural constraint rather than a cyclical fluctuation.*
- *Further, telecom operators are expected to report a largely muted March-quarter performance with steady underlying growth offset by fewer operating days and rising cost pressures related to energy headwinds.¹ Near-term earnings are being weighed down by seasonality, cost pressures and lack of tariff hikes during the quarter.*
- *MSMEs are being viewed as the next big revenue stream for telcos. Digital commerce and local advertising for small businesses can be viewed as a way forward for Indian companies.*

Opportunities Ahead



As per an ET Report, If telcos onboard ~one-sixth of MSMEs with each MSME doing three orders a day worth Rs 1,000, a 3% commission holds the potential to generate Rs 33,000 cr every year.²



Local advertising could boost telecom earnings up to Rs 50,000 crore. Telcos would need MSMEs to pay for a range of digital services, including cloud tools, payments, and marketing solutions.



Low data consumption in rural India presents an opportunity via Expanding Digital literacy, broadband rollouts, UPI adoption translating into higher ARPU.



States with lower tele-density such as Bihar (63.13% (as of Feb'26), UP (70.43%) and large populations present considerable expansion opportunities.



10. Urban Infrastructure

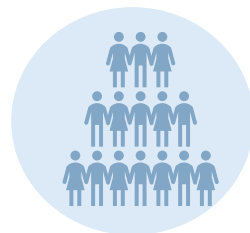
India's Urban Infrastructure Overview : Laying the Foundation for Inclusive Urban Growth

Quick Facts



2X

Urban population is projected to almost double to 951 million by 2050, and to increase to 1.1 billion by 2070



The number of Indians residing in urban areas increased sixfold over the last 60 years.



70% of New employment to be created in India by 2030 is expected to be in cities.



Indian cities are projected to produce 285 million tons of solid waste by 2035 and 415 million tons by 2050 with great potential to modernize SWM system.



In 2020, cities hosted over one-third of the national population – around 480 million people.



Between 2022 and 2070, more than 144 million urban dwelling units will be needed in India, more than doubling the existing housing stock.



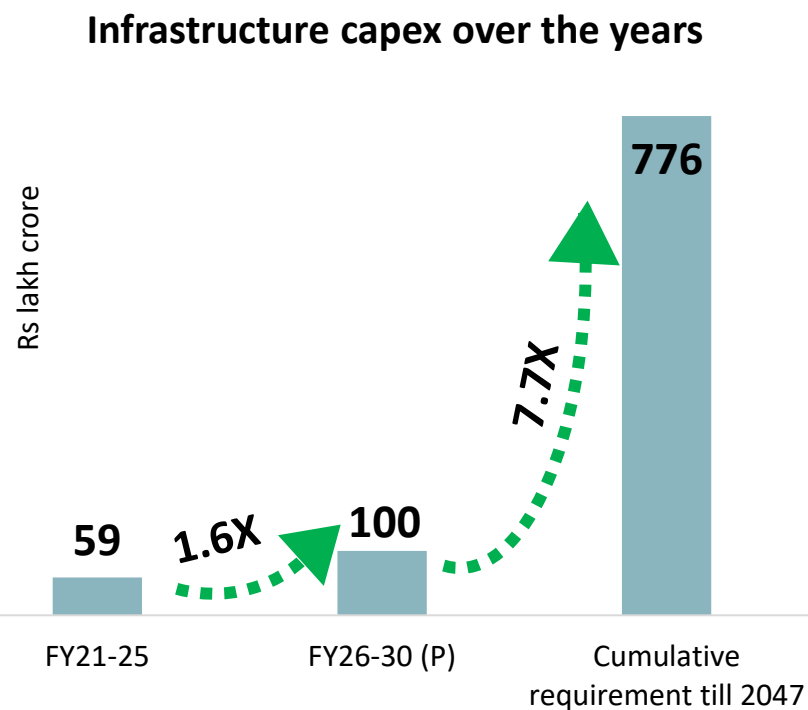
The total estimated investment needs for new resilient and green urban infrastructure and services are estimated at \$2.4 trillion by 2050 and \$10.9 trillion by 2070.



If left unchecked, Damage due to riverine flooding in Indian cities could cost as much as \$770 billion each year by 2050.

India's Urban Infrastructure : Estimating Urban infra spending required over next two decades

- Infrastructure capital expenditure has witnessed 20% CAGR between FY21 to FY24 and touched Rs 13 lakh crores mark in FY25.
- Share of private investments is expected to increase from 9% in FY24 to 12% in FY25 and is expected to grow further in the coming years.
- As per NaBFID-ICRA's study, the cumulative spend requirement for infrastructure between FY26 to FY47 stands at ~ Rs. 680 to ~770 trn, **out of which close to 50% is required for fulfilling urban infrastructure needs**. Between FY26 to FY30, the infra capex requirement estimated at ~ Rs. 136 trillion.



Sector-wise cumulative requirement till 2047	In Rs trillion	In USD trillion
Road (NH + states)	83-91	0.9-1.0
Rail	75-77	0.8
Port	~6	~0.1
Airports	7-7.5	~0.1
Power	143-154	1.6-1.7
Telecom (incl. data centres)*	32-37	~0.4
Others (urban infra, river linking)	335-405	3.8-4.6
(w/w) Urban infrastructure	310-375	~3.5-4.2
Irrigation (incl. river linking)	~27-30	~0.3
Total	776	8.7

Urban Infrastructure in Transition: Monitoring Progress of AMRUT 2.0

- It is a centrally sponsored scheme with a total outlay of ₹1,00,000 crore including a Central Assistance of ₹50,000 crore and rest from States and Urban Local Bodies (ULBs). The thrust areas of the Mission are water supply, sewerage & septage management, storm water drainage, green spaces & parks, non-motorized urban transport, reforms management & support and capacity building.
- Universal coverage of water supply and sewerage are the priority sectors under the Mission. Tap coverage has increased from around 44% in 2011 to 70% (with current population) in all cities & sewer and septage coverage from 32% to 62% in AMRUT cities through AMRUT interventions.

Against a total State Annual Action plan (SAAP) size of ₹77,640 crore, 6,009 projects worth ₹83,574 crore have been taken up of which works worth ₹78,913 crore have been physically completed.

Sector-wise implementation	Projects Awarded	Projects Completed	Outcome
water supply	1,404 projects worth ₹43,428 crore	<ul style="list-style-type: none"> Projects worth ₹41,470 crore have been physically completed. 	<ul style="list-style-type: none"> 189 lakh water tap connections (new/ serviced) have been provided against the target of 139 lakh.
sewerage and septage management sector	889 projects worth ₹34,501 crore	<ul style="list-style-type: none"> works worth ₹32,119 crore have been physically completed. 	<ul style="list-style-type: none"> 149 lakh sewer connections provided against a target of 145 lakh.
storm water drainage sector	840 projects worth ₹3,016 crore	<ul style="list-style-type: none"> works worth ₹2,797 crore have been physically completed. 	<ul style="list-style-type: none"> elimination of 3,672 waterlogging points another 233 points proposed to be eliminated through ongoing drainage projects
green spaces and parks sector	2,524 projects worth ₹1,605 crore have been awarded	<ul style="list-style-type: none"> works worth ₹1,257 crore have been physically completed. 	<ul style="list-style-type: none"> total green area through AMRUT projects now exceeds to more than 5,420 acre.

Urban Infrastructure in Transition: Monitoring Progress of Key Flagship Schemes

Policy/Scheme	Target	Progress made till Dec'25
Smart cities mission	<i>Develop 100 cities into sustainable, citizen-friendly, and technologically advanced urban centers</i>	<ul style="list-style-type: none"> 93% completion of 8,063 projects achieved. (as of March 30th, 2026) 100% completion of Integrated Command and Control Centres (ICCCs), leading to measurable improvements in urban liveability, mobility, safety, and environmental outcomes.
Pradhan Mantri Awas Yojana – Urban 2.0 (PMAY-U 2.0 / Urban Housing)	<i>provide affordable housing to 1 crore urban poor and middle-class families over five years, starting September 1, 2024</i>	<ul style="list-style-type: none"> ~1.22 crore houses sanctioned and 1.14 crore houses grounded (till 9th December 2025). Unified RERA Portal launched nation-wide outreach campaign launched called Angikaar 2025 (4 Sept – 31 Oct 2025) to accelerate last-mile implementation of PMAY-U 2.0.
PM -eBUS Sewa Scheme	<i>Deployment of 10,000 air-conditioned electric buses in 116 cities (populations 3-40 lakhs) by 2027</i>	<ul style="list-style-type: none"> 3,622 buses have been sanctioned in the calendar year (Jan to Dec 2025) ₹ 60.73 crore were sanctioned for the development of associated infrastructure which includes Behind-the-meter (BTM) Power and Civil Depot infrastructure. Out of 85 Civil Depot proposals, construction work has started in 52 depots spread across 44 cities, and out of 88 BTM proposals, 40 depots have begun works across 33 cities.
Swachh Shehar Jodi implemented under the Swachh Bharat Mission – Urban (SBM-U)	<i>pairs 72 high-performing "mentor" cities with low-performing "mentee" cities within the same state to replicate best sanitation practices</i>	<ul style="list-style-type: none"> 100-day program launched to showcase the impact of city-to-city mentorship in driving urban transformation Nearly 300 MoUs signed simultaneously across nation thus marking the beginning of a 100-day phase of creating a dynamic platform for knowledge-sharing, mentoring, and handholding, which will be evaluated in Swachh Survekshan 2026 (due in mid 2026)
Dumpsite Remediation Accelerator Programme (DRAP)	<i>aims to remediate 214 high-impact, major landfill sites, covering 80% of legacy waste, to achieve "Zero Dumpsite" status by Sep 2026</i>	<ul style="list-style-type: none"> ~ 1,428 sites undergoing remediation, with ~80% of the legacy waste concentrated in 214 sites across 202 ULBs. DRAP will prioritize these high-impact locations, covering approximately 8.8 crore MT of legacy waste.

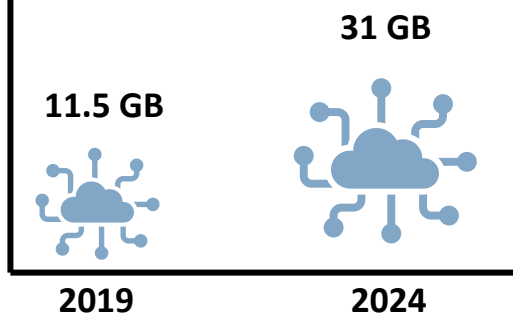


11. Data Centres

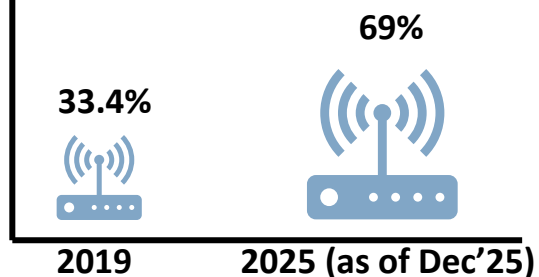
India's Data Centre Boom: Trends and Transformations

India's Data Revolution: Explosive Growth in Usage and Capacity Over the Past Five Years

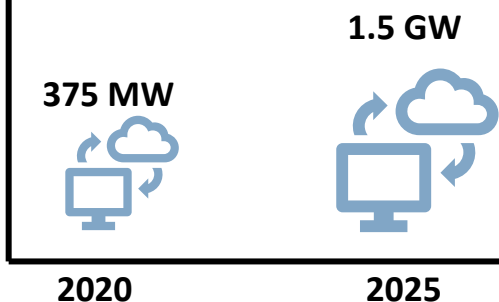
Data consumption/user/month¹



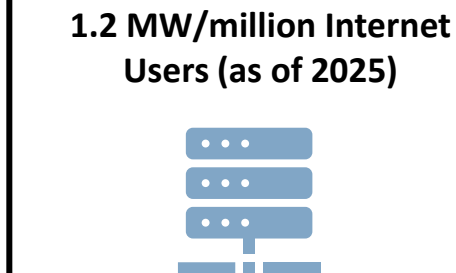
Internet penetration²



Growth in Data centre Capacity³



Data centre penetration⁴

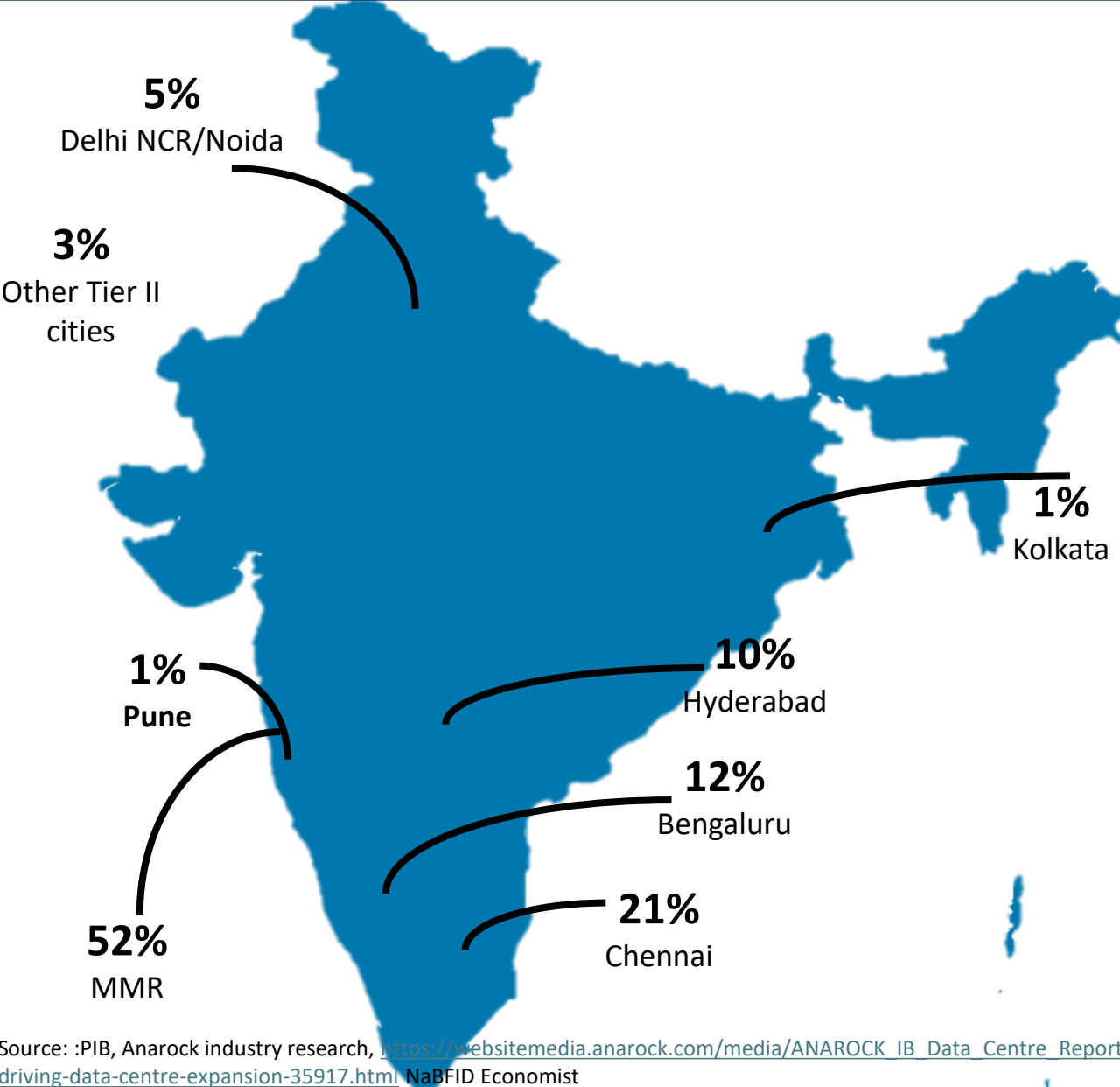


Quick Facts



- The data centre industry in India is growing steadily. The total data centre capacity in the country has increased from about 375 MW in 2020 to around 1500 MW by 2025.
- To support AI development, about 38,231 GPUs have been onboarded through 14 empaneled service providers/data centres under the AI compute capacity framework.
- These are being provided to startups, researchers, academia and other eligible users at a subsidised average rate of ₹65 per hour. This is about one-third of the global average cost.
- These Data centres are located across the country such as Mumbai, Navi Mumbai, Hyderabad, Bengaluru, Noida and Jamnagar

India's Data Centre Boom: City-Level Analysis of Existing Data Centre Infrastructure



- Mumbai Metropolitan Region and Chennai remain key hubs for data centre operators, jointly accounting for ~73% of India's total data centre capacity.
- Supply expansion has been sharply concentrated in these markets, with the MMR region registering ~92% growth between 2022–2024, while Chennai has seen an exceptional ~340% surge over the same period. This underscores substantial capital deployment by data centre operators to scale capacity in these two hubs over the past three years.
- The future supply mix is expected to tilt further toward MMR and Chennai, with their combined share rising to ~75%, up from the earlier 70:30 split with other cities.
- In terms of capacity utilization, the highest levels are observed in MMR (~81%), followed by Delhi-NCR (~76%), Bengaluru (~75%), and Chennai (~65%).
- India has emerged as a major hotspot for hyperscalers, with significant land acquisitions in cities like Hyderabad and Mumbai to support large-scale data centre infrastructure.
- Over the past few years, nearly 440 acres of land have been acquired for hyperscalers development in the country, as global cloud providers and domestic players seek to establish high-capacity facilities

India's Data Centre Boom: Comparative analysis and forecasts on capacity expansion in India

- India's digital adoption levels are broadly in line with global trends, with mobile subscriber share (~77%) and internet penetration (~67%) in 2025 nearing the global averages of ~70% and ~73%, respectively. However, this parity does not extend to infrastructure, as data centre capacity in India remains significantly lower at just ~1.2 MW per million internet users, compared to the global average of ~5 MW.
- Further, India generates about 20% of the global data, however in terms of the Data Centre capacity, it has a share of just 3%.
- AI data centres, play a critical role in the infrastructure layer of the AI architecture. Investments of around USD 70 billion are already underway in India, with announcements of investments of around USD 90 billion.
- To further encourage long-term investments, Budget 2026-27 has proposed a tax holiday till 2047 for foreign companies providing cloud services to customers globally using data centre services from India. Such companies will provide services to Indian customers through an Indian reseller entity. A safe harbour of 15 percent on cost has also been proposed where the data centre service provider in India is a related entity.

Comparison of India and Global Digital Metrics

	India	Global
Internet users (%) of population	67%	73%
Mobile phone subscribers (%) of population	77%	70%
Data centres* (MW per million users)	1.2	5

Investment in AI Startups (2020-2025) (as per OECD.ai)

In bn \$	Global	US	China	India
AI infrastructure	1072	643	163	20
Generative AI	86.6	71.2	4.2	0.7
AI Compute	153.9	97.1	31.2	0.5

India's Data centre boom : The green push



L&T Vyom

The Gujarat govt signed a memorandum of understanding with L&T Vyom to set up a 250MW green, AI-ready data centre campus at Dholera Special Investment Region (SIR), entailing an investment of Rs 25,000 crore.

adaniconnex

Adani Group

Adani Group will invest \$100 billion in India to build renewable energy-powered AI ready data centres by 2035



Google

Google plans to invest up to \$6 billion in India to establish its first data center in the country, a project that could become the largest of its kind in Asia.

As per a Reuters report, Google is committing \$4 billion to develop a 1-GW data center in the southeastern state of Andhra Pradesh.



EQUINIX

Equinix

Equinix data centre in Mumbai, India, is spread across 3.7 acres with a US\$750 million (~ Rs 6,000 crore) investment.

It is powered significantly by a 26.6 MW solar project in Yavatmal, with 60% of its energy sourced from this renewable project



Yotta

Yotta's first data centre building in Navi Mumbai has a power capacity of 50MW.

The company claims it has the lowest PUE of 1.4; the facility is power efficient and houses captive power distribution infrastructure.



STT GDC

STT GDC India's facilities derive 345 of its power from renewable sources and recently added to the 99MUs/annum (99 Million kWh) of renewable energy under a captive structure, for its Maharashtra facilities

Indian Data Centre Boom: : The Road Ahead



Projections and Outlook

India's data centre installed power capacity is set to exceed 2 GW by 2026 and is projected to expand nearly fivefold to over 8 GW by 2030. This rapid scale-up is expected to drive capital investments of more than \$30 billion.



The ~\$30 billion investment is expected to be backed by long-term institutional capital from global investors. Sovereign wealth funds and private equity players increasingly view India's data centre sector not as a speculative real estate opportunity, but as essential, utility-like infrastructure.

The expected electricity demand from the growth of AI and other large-scale data centres is factored into the planning process of government and is estimated to reach ~14 GW by 2031–32.

To minimize water usage, the Indian data industry is adopting advanced cooling technologies such as direct-to-chip liquid cooling, adiabatic cooling and immersion cooling.

Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India (SHANTI) Act, will ensure development of reliable power solutions for AI and data centres by supporting future deployment of small modular and micro nuclear reactors.



12. Energy Storage Infrastructure

India's Energy Storage Systems (ESS) Overview : Reaching its next stage of Evolution

Need for Energy Storage Systems (ESS)

- India has achieved a landmark in its energy transition journey by reaching 50% of its installed electricity capacity from non-fossil fuel sources in June 2025, more than five years ahead of the target set under its Nationally Determined Contributions (NDCs) to the Paris Agreement.
- ESS can be used for storing available energy from Renewable Energy and further can be used during peak hours of the day. The variance (due to time, climate, season, geographic location) & intermittency of Renewable Energy (RE) presents a challenge in its incorporation in the energy mix in maintaining grid stability and uninterrupted power supply.
- Govt. has set an ambitious target of adding 57 GW Pump Storage Projects capacity by 2031-32 out of which, 12 GW is under construction and rest is under development stage. India has the potential of PSPs of about 258 GW with around 7 GW (2.7%) developed so far.
- A long-term trajectory for Energy Storage Obligations (ESO) has been notified by the Ministry of Power to ensure sufficient availability of storage capacity with obligated entities. As per the trajectory, the ESO shall gradually increase from 1% in FY 2023-24 to 4% by FY 2029-30, with an annual increase of 0.5%. This obligation shall be treated as fulfilled only when at least 85% of the total energy stored is procured from Renewable Energy sources on an annual basis.

Trajectory of Energy storage capacity Requirement

2026-27

By 2026-27, the energy storage capacity requirement is projected to be 82.37 Giga Watt hours (GWh)



2031-32

~48 GWh of this would come from Pumped Storage Projects (PSP) and ~34.72 GWh from Battery Energy Storage System (BESS) .



2047

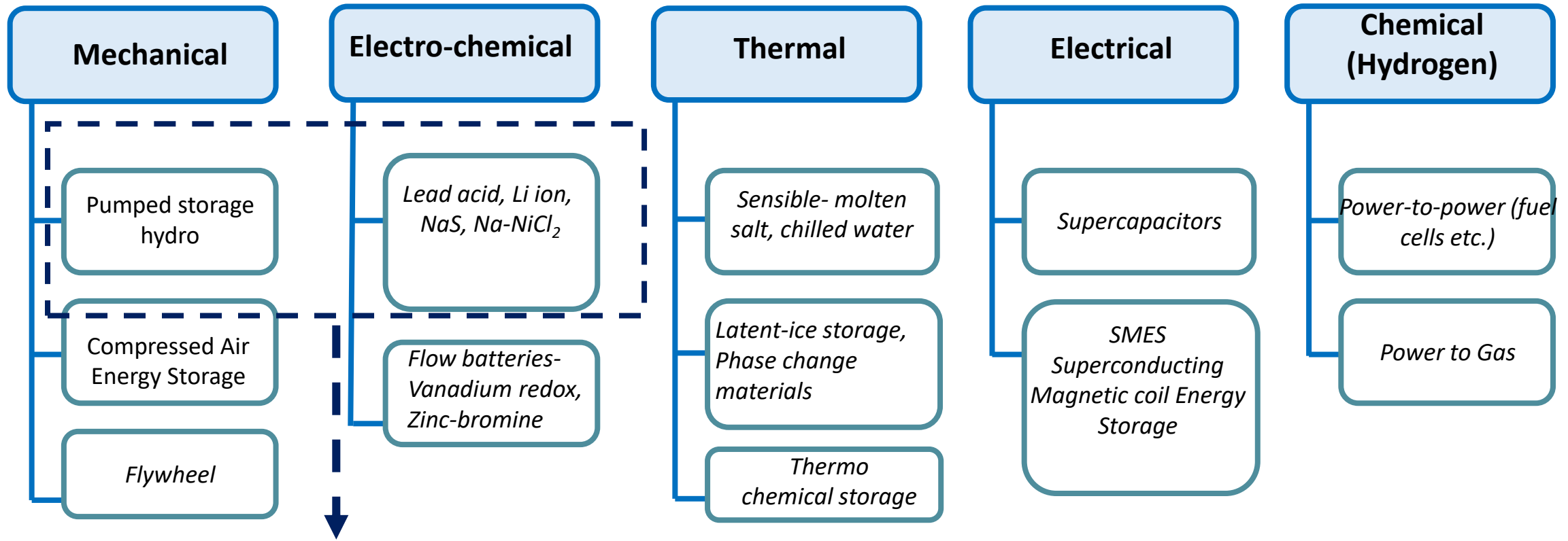
By 2031-32, this is expected to further increase to ~411GWh (~175 GWh from PSP and ~236 GWh from BESS)¹



By the year 2047, the requirement of energy storage is expected to increase to 2380 GWh (540 GWh from PSP and 1840 GWh from BESS), due to the addition of a larger amount of RE in light of the net zero carbon emission in 2070.⁶⁸

Types of Energy Storage Systems (ESS) in India : Trends and expected trajectories

- The Ministry of Power has taken several initiatives to accelerate Pumped Storage Projects (PSPs) to aid renewable integration and strengthen grid stability, with 10 projects aggregating 11,870 MW currently under construction.
- In September 2023, a Viability Gap Funding (VGF) scheme was introduced to support Battery Energy Storage Systems (BESS), under which 13.22 GWh of capacity is being implemented with a budgetary outlay of Rs 3,760 crore.
- Building on rising demand, an additional VGF scheme was approved in June 2025 to develop 30 GWh of BESS capacity, backed by Rs 5,400 crore of support from the Power System Development Fund (PSDF).



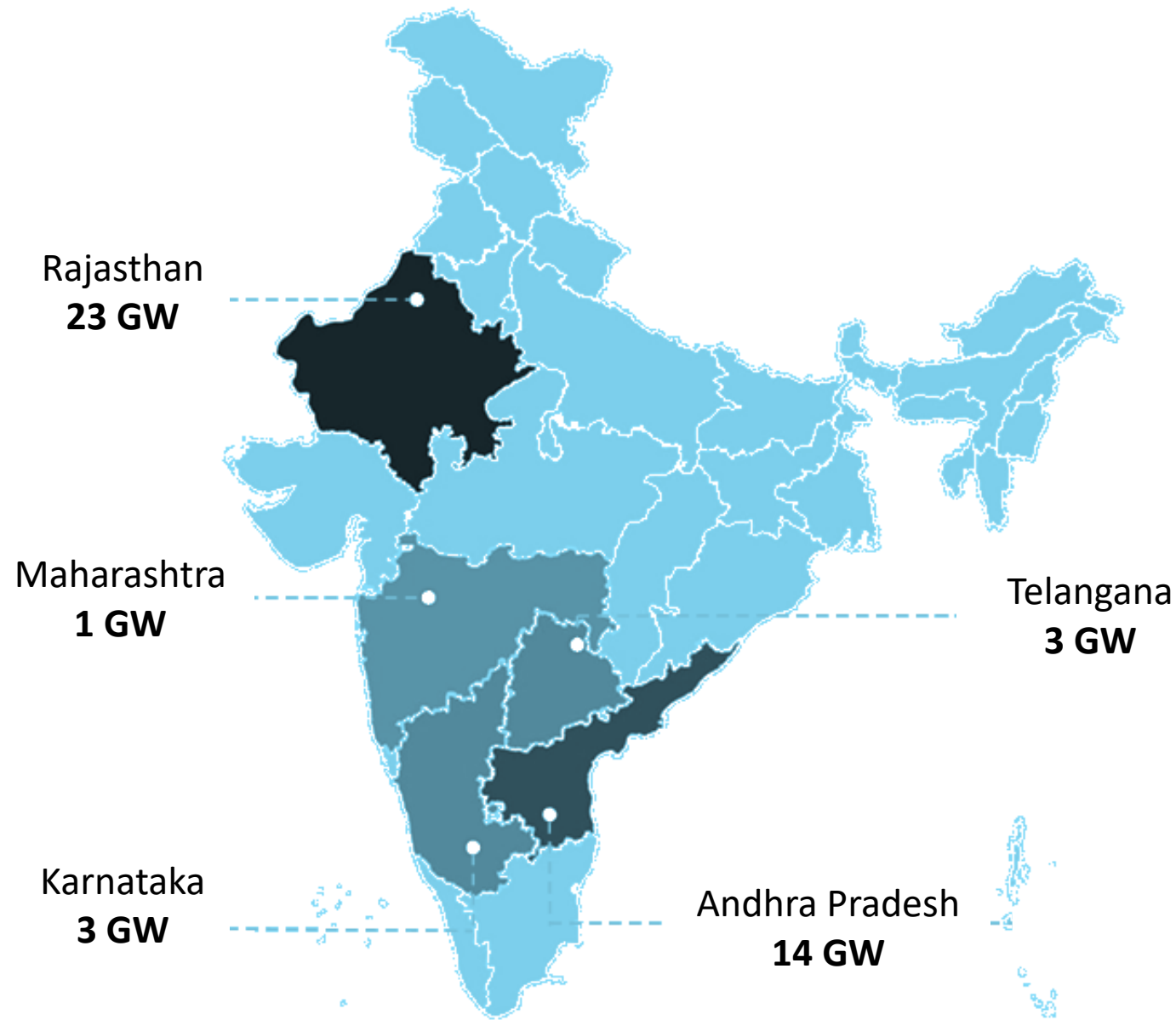
- These two storage technologies are set to account for nearly the entire market. As per the National Electricity Plan (2023) published by the Central Electricity Authority (CEA), a requirement of 208 GWh of Battery Energy Storage Systems (BESS) has been projected by 2030 to enable seamless integration of the increasing share of renewable energy in the grid.

PSPS and BESS will complement rather than compete

- Energy storage capacity in India is set to expand at a pace exceeding both domestic renewable capacity additions and global storage growth, largely driven by its currently low base. While Pumped Storage Projects (PSPs) dominate the existing capacity, the mix is expected to shift significantly, with Battery Energy Storage Systems (BESS) emerging as the primary contributor by FY30, in line with global trends.

PARAMETERS	PUMPED STORAGE PROJECT SYSTEM (PSPS)	BATTERY ENERGY STORAGE (BESS)
MATURITY	<i>Highly mature and commercialized</i>	<i>Evolving, partially commercialised</i>
LIFE SPAN	<i>Long, often more than 40 years</i>	<i>Short, around 8 years</i>
OUTPUT QUALITY	<i>Moderate, 8 hrs/day with ~1.5 cycles/day. Produces both active and reactive power, quick ramping time</i>	<i>Low, 2-4 hours discharge cycle. Produces only active power. Response within seconds</i>
IMPORT DEPENDENCE	<i>Low to Moderate, many components shared with hydro plants for which capability exists in India</i>	<i>High, inadequate cell (and its components) capacity makes it reliant of imports. Rare earths needed are globally disparate</i>
ESG IMPACT	<i>Moderate, impacts land use, natural flow of river, and may need eco-sensitive and tribal areas</i>	<i>Moderate, mining ecosystem is wrought with issues. E-waste and its disposal remains a challenge</i>
LCOS	<i>Moderate, unlikely to reduce further</i>	<i>Moderate, likely to reduce further</i>
PROJECT SETUP	<i>High gestation period involving complex clearances Takes up a vast area, potential is in specific remote locations</i>	<i>Low gestation period Can be set up anywhere with low space requirement</i>
THE VERDICT	<i>Smaller share but essential for peak shaving. A greater share of government/PSU interest is expected in this space</i>	<i>Dominant due to rapid response time, flexibility, and lower future LCOS. Likely to see extensive private participation</i>

Battery Energy Storage to lead the charge : Planned BESS Addition of 44+ GW by 2030



Government initiatives to support ESS



India's Energy Storage Systems: Growth Prospects and Outlook Ahead

- India's energy transition goals, will require significant investment in BESS infrastructure. The planned addition of 44+ GW of BESS capacity by 2030 is seen as a critical step toward integrating renewable energy and enhancing grid stability.
- Under the Viability Gap Funding (VGF) Schemes for development of BESS, a capacity of 43,220 MWh is targeted for addition.

India's Battery Energy Storage System (BESS) market is projected to expand to 66 GW by 2032 from less than 0.2 GW currently, reflecting a significant increase in capacity.



This presents an investment opportunity worth Rs 5 lakh crore in the sector and estimates that widespread adoption of BESS could help avoid over 2,000 million tonnes of CO₂ emissions.

- Government policies are expected to play a crucial role in this growth
- Measures like 100% customs duty waiver on battery imports, a 10-year transmission charge exemption, and production-linked incentives (PLI) for advanced chemistry cell (ACC) battery storage will complement it further.
- The government's goal of achieving 4% energy storage obligations by 2030 from the current 1% is expected to create further demand for BESS.

- Strategic investments in BESS projects will optimize energy storage costs, enabling distribution companies (DISCOMs) to cap energy costs at ₹4.8 per unit through peak shaving.
- Several states have already announced ambitious BESS targets, with Rajasthan leading at 23 GW, followed by Andhra Pradesh (14 GW), Karnataka (3 GW), and Telangana (3 GW). Maharashtra has also planned for 1 GW capacity

The image shows a cityscape from an elevated perspective. In the foreground, there is a large, modern apartment complex with multiple towers. The buildings are primarily white with red or brown accents. The background shows a dense urban area with older, more varied buildings and a hazy sky. A semi-transparent white box is overlaid on the middle of the image, containing the title text.

13. Affordable Housing

Affordable Housing in India Overview : Driving the sustainable housing initiative

Affordable Housing parameters as per NITI Aayog



As per NITI AAYOG the following working definitions have been adopted for an Affordable House :

- *Affordable house: A dwelling unit with a carpet area of up to 60 sq. m in metropolitan cities and 90 sq. m in nonmetropolitan cities, with a value not exceeding ₹60 lakh in metropolitan areas and ₹45 lakh in non-metropolitan areas.*
- *Affordable housing project: A project in which at least 50% of the permissible Floor Area Ratio (FAR) or Floor Space Index (FSI) is dedicated to affordable housing dwelling units.*

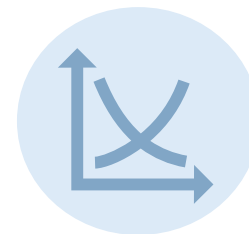
Quick facts



The total outstanding credit of Scheduled Commercial Banks to Housing sector stood at ~Rs 10 lakh cr (as of Feb'26).



The share of HFCs in total credit to the housing sector (banks, HFCs and NBFCs combined) decreased to 18.8 per cent as at end-March 2025, as the number of HFCs came down due to conversion of two HFCs into NBFCs



A CII–Knight Frank report (Dec 2024) projects a 3.12 crore urban deficit by 2030, while FED estimates range between 5-7 crore units. 'Housing for All' targets to add another ~ 3 crore units (1 crore urban, 2 crore rural) by 2029.



The total addressable housing market extends well beyond the top 40 cities, reaching into the next 100 and 200 cities where the urban-rural divide is increasingly blurring.

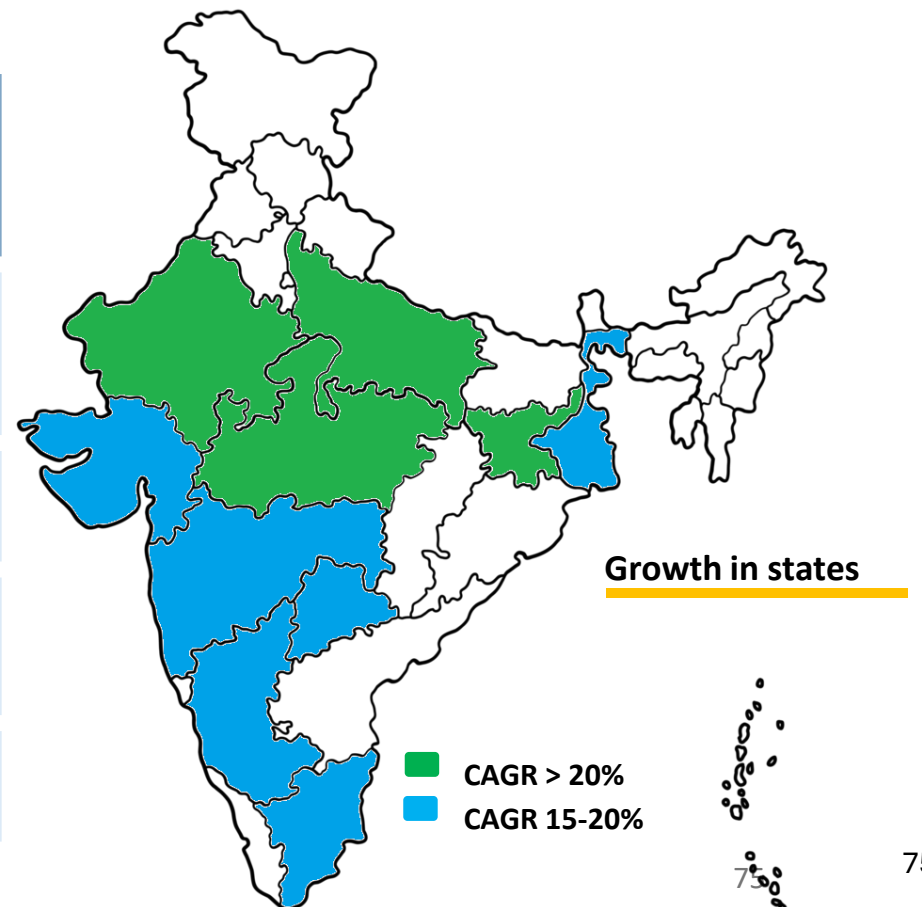
Tracking the Growth : Housing Finance Companies' Asset Under Management (AUM) Over 5 Years

- Most HFCs rely heavily on bank term loans for their funding, while a few larger players access the capital market. Borrowings from banks and debentures remained the major sources of funds for HFCs (75.3 per cent of total resources mobilized at end-March 2025). The share of bank borrowings decreased moderately while the share of debentures increased (as of FY25).
- As per EY analysis, affordable housing sector is expected to grow at a CAGR of 25% during the 2022-27 period. Uttar Pradesh, Maharashtra, West Bengal, Andhra Pradesh, Tamil Nadu, Bihar, Rajasthan, Madhya Pradesh, Karnataka, and Gujarat drive over 75% of India's demand.

Housing Companies

	Low-Income (below Rs 10-15 lakh)	Affordable (below Rs 20-25 lakh)	Low-middle income (Rs 20-25 lakh)	Prime (Rs 50 lakh and above)
Aadhar (Rs 28,790 cr)		ICICI Home (as of FY25) (Rs 38,000 cr+)	LIC housing (Rs 311,417 cr) (as of FY25)	LIC Housing
Aavas Financiers (Rs 22,200 cr)		Shriram Housing Finance (Rs 20,039 cr)	PNB Housing (Rs 86,048 cr)	PNB Housing
Axis Asha scheme under Axis bank (Target Incremental disbursement of Rs. 10,000 cr in FY25 achieved)		Grihum Housing (Rs 9,374 cr) (as of FY25)		
Home First (Rs 14,924 cr)		Shubham Housing (Rs 6,034 cr) (as of FY25)		

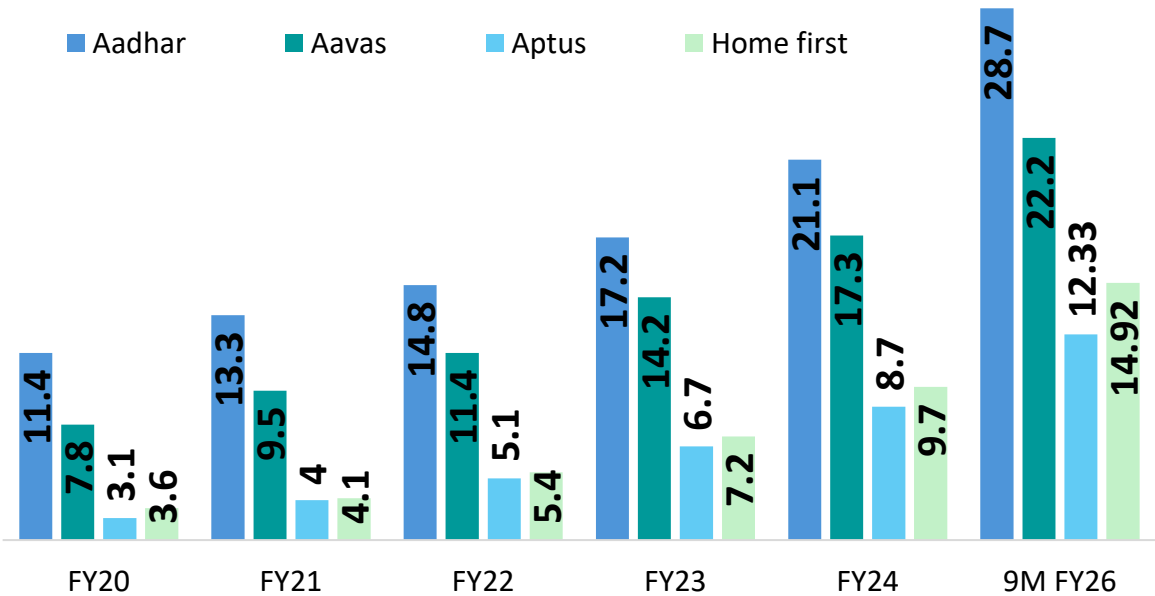
Ticket size



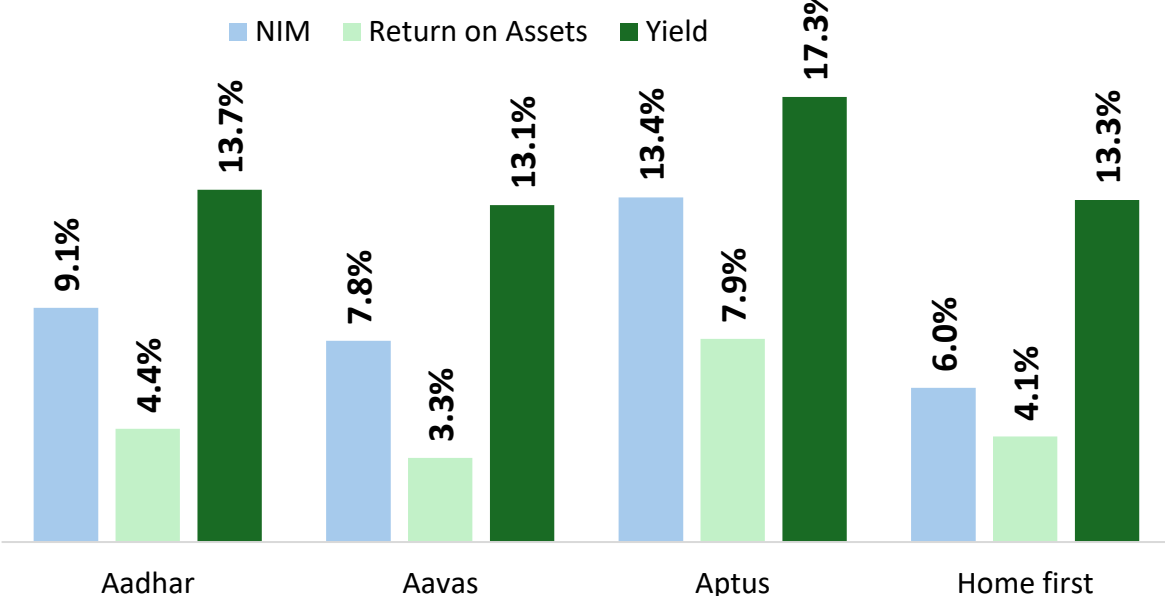
Tracking the Growth : Assessing Housing Finance Companies' performance on keys indicators

- The affordable housing finance sector in India is expected to reach Rs 67 lakh cr by FY30. The sector demonstrates strong growth potential, with all players showing consistent AUM increases from 2020 to 2024.
- Aptus and Home First demonstrate the most significant growth rates, indicating ambitious market expansion. Aadhar, being an established player, has the highest AUM in FY26 (Rs 28,790 crores).
- Low-income housing is appealing to HFCs as it offers higher returns. Housing loans also carry lower default risk, as they are usually for self-occupied homes. HFCs focusing on this segment recorded the highest profitability, largely due to higher net interest margins (NIMs), driven by increased interest rates, despite rising funding costs.

AUM for major HFCs ('000 crores)



Performance on key indicators (9M FY26)



Source: Annual reports of these companies, EY analysis, CII, NaBFID Economist

Driving policy action: Flagship initiatives in affordable housing in India

Policy/Scheme	Description	Target customers	Year of inception	Target	Progress (latest)
Rajiv Awas Yojana (RAY)	<i>Strives to make India slum-free and upgrade standard of living</i>	<i>Slum residents</i>	<i>2009</i>	<i>Slum-free India</i>	
Pradhan Mantri Awas Yojana (PMAY 1.0)		2015			
Urban (PMAY-U)	<i>Grants interest/subsidies for urban poor on home loans</i>	<i>EWS, low and middle Income</i>	<i>2015</i>	<i>1 cr houses by 2024</i>	<i>96 lakh houses completed (b/w 2015 to 2024)</i>
Gramin (PMAY-G)	<i>Provides financial support for building or improving rural homes</i>	<i>Rural poor</i>	<i>2015</i>	<i>2.95 cr houses by 2024</i>	<i>2.6 cr houses completed</i>
Affordable Rental Housing Complexes (ARHCs)	<i>Transforms un-occupied government houses into rental complexes</i>	<i>Urban migrants & poor</i>	<i>2020</i>	<i>Provide affordable rental housing for urban migrants/poor</i>	
National Urban Rental Housing Policy (NURHP)	<i>Encourages rental housing as a sustainable choice for urban dwellers</i>	<i>Urban residents</i>	<i>2021</i>	<i>Increase rental housing stock</i>	
Pradhan Mantri Awas Yojana (PMAY) 2.0		3 cr houses by 2029			
Urban (PMAY-U)	<i>Offers interest subsidies on home loans for low-income urban residents</i>	<i>EWS, low and middle income</i>	<i>2024</i>	<i>1 cr houses by 2029</i>	<i>1.22 cr houses sanctioned and 1.14 cr houses grounded (till 9th Dec 2025). (cumulatively)</i>
Gramin (PMAY-G)	<i>Provides funding for building or upgrading homes in rural areas</i>	<i>Rural poor</i>	<i>2024</i>	<i>2 cr houses by 2029</i>	<i>2.99 cr houses complete (cumulatively)</i>



14. Cold Chain Infrastructure

Cold Chain infrastructure in India : Overview

Market size and projected growth rate¹

The India cold chain logistics market size reached ~USD 13 bn in 2025.



The market is expected to reach ~USD 27 bn by 2034, exhibiting a growth rate (CAGR) of 8.62% during 2026-2034.

Key drivers for growth of the cold chain sector in India

Growth in organized retail

- The increasing working population has lesser time to cook at home and has high purchasing power.
- Acceptance of frozen food products and increase in income levels.

Government initiatives

- Incentivizing investment into the development of cold chain infrastructure.
- Incentives include subsidy incentives, fiscal incentives etc.

Growth in processed food sector

- Marked improvement in consumer preferences for processed foods.
- Increasing demand in refrigerated dairy products due to their nutritive value

Major Cold Chain Infrastructure Components

Infrastructure component	Desirable set-up location	Current usage
Modern Pack-House	At farm gate for fresh produce pre-conditioning	For exporters mostly
Long-haul transport	From pack-house to mandi/wholesale buyer	Across the country
Cold storage bulk	At farm gate/food processing premises	At farm gate/food processing centre
Cold storage hubs	Close to consumption/distribution centre	Across the country
Ripening Chamber	Close to consumption/distribution centre	Near to Consumption centre
Last mile transport	Within distribution city	Major cities
Retail/front end	Last mile merchandizing	Front end
Food processing Unit	Factory dispatch of food product as source point	Cluster parks, production zones

Cold Chain infrastructure: Estimating loss of Agricultural produce due to lack of post harvest infrastructure

Percentage Loss of Major Agricultural Produce in India

Crops/commodities	Loss (%)	
	As per ICAR-CIPHET study (2015)	As per NABCONS study (2022)
Cereals	4.65 - 5.99	3.89 - 5.92
Pulses	6.39 - 8.41	5.65 - 6.74
Oilseeds	3.08 - 9.96	2.87 - 7.51
Fruits	6.70 - 15.88	6.02 - 15.05
Vegetables	4.58 - 12.44	4.87 - 11.61
Plantation crops & spices	1.18 - 7.89	1.29 - 7.33
Milk	0.92	0.87
Fisheries (Inland)	5.23	4.86
Fisheries (Marine)	10.52	8.76
Meat	2.71	2.34
Poultry	6.74	5.63
Egg	7.19	6.03

MARKET CHALLENGES



Lack of first and last mile connectivity

- While India has made progress in creating large-scale, centralized cold storage, the inability to transport goods efficiently from these hubs to end consumers or retailers especially in rural areas compromises entire supply chain.



Inadequate Infrastructure in Rural areas

- The lack of sufficient infrastructure, particularly in rural areas hampers the seamless movement of perishable goods and affects the overall efficiency of the cold chain.



High Energy Costs:

- Maintaining cold storage & transportation systems requires substantial energy, leading to high operational costs; compounded by inconsistent power supply in many regions, necessitating investments in backup energy solutions.

- Despite availability of Cold chain infrastructure, demand remains weak.*
- Farmers lack incentives to utilize these facilities due to the relatively high cost of services. Additionally, inadequate quality enforcement allows produce with a shorter shelf life (e.g., 30 days) to be absorbed in markets that ideally require longer shelf stability (around 60 days), reducing the necessity for cold storage.*
- In contrast, cold chain facilities located near export hubs operate at full capacity, driven by stringent quality standards and compliance requirements for exports.⁸⁰*

Analysing Cold Chain infrastructure requirement in India

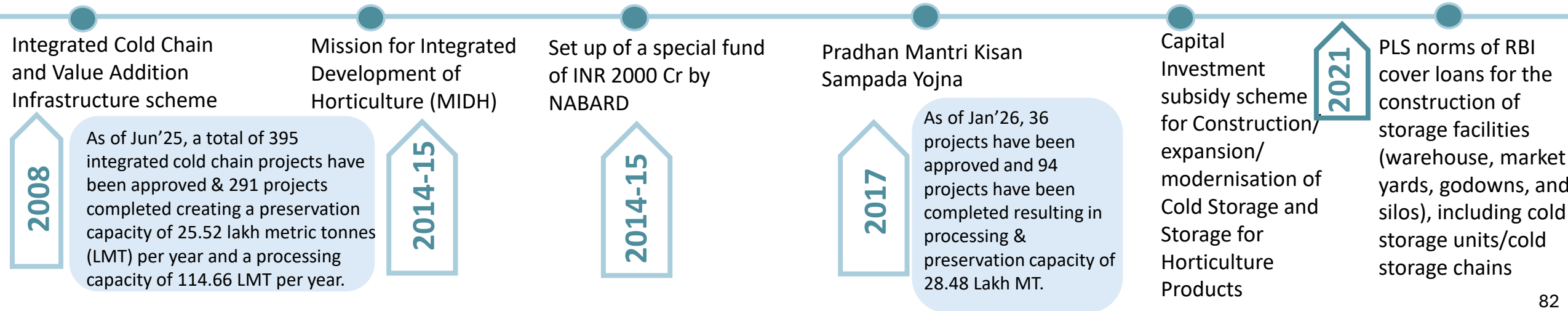
One of the main reasons for the high losses in the supply chain of perishables is the absence of adequate and efficient cold chain infrastructure right from the farm gate to the consumers. The given gap study, excludes milk, meat, marine and processed products (lightly perishable) for working out the requirement of cold chain infrastructure.

S. no.	Component	Existing capacity	Approximate Requirement	Infrastructure Gap
1.	Integrated pack houses	250 numbers	70,000 numbers	69,750 numbers
2.	Reefer trucks	< 10,000 numbers	62,000 numbers	~52,000
3.	Cold store (Bulk & distribution hubs)	32 million tones	35 million tones	3 million tonnes
4.	Ripening Chambers	800 numbers	9000 numbers	8200 numbers

- By application, dairy & frozen desserts accounted for 24% of the India cold chain logistics market size in 2024, yet pharmaceuticals & biologics are poised for the strongest 6.7% CAGR over the forecast period (2024-30).
- By service type, refrigerated storage held 41% of the India cold chain logistics market share in 2024, whereas value-added services are projected to expand at a 5.4% CAGR through 2030.
- By temperature type, frozen applications captured 52% revenue share in 2024, while chilled applications are forecast to deliver the fastest 6.1% CAGR to 2030.
- By geography, West India led with a 23% share of the India cold chain logistics market in 2024; East India is advancing at a 6.2% CAGR through 2030.

Fiscal Incentives and Policy Initiatives for Growth of Cold chain infrastructure in India

1.	Income tax/Corporate tax	
	Items	Provisions
	Setting up and operating a cold chain facility; and setting up and operating warehousing facility for storage of agricultural produce. (not available for expansion of the unit)	Deduction to the extent of 100% is allowed for expenditure incurred on investment under Section 35-AD of the Income Tax Act 1961.
2.	Customs duty	
	Items	Provisions
	Cold storage, cold room (including farm level pre-cooling), cold chain including pre-cooling unit, pack houses, sorting and grading lines and ripening chambers.	Concessional 5% Basic Customs Duty (BCD) is presently available under Project Imports for cold storage, cold room (Notification No. 21/2016-Customs, dated 1st March,2016)
	Refrigerated Container	Reduced from 10% to 5% (Notification No. 12/2016-Customs, dated 1st March,2016)



Cold Chain infrastructure: Strategic Recommendations



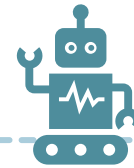
Infrastructure Investment

- Substantial investment in standardized cold storage facilities and renewable energy sources is essential to modernize the cold chain infrastructure. Public-private partnerships should be encouraged to achieve this goal.



Regulatory Reforms

- Simplifying regulatory processes and providing financial incentives can reduce operational delays and encourage private sector investment.
- Ensuring compliance with stringent quality standards through regular inspections is also crucial.



Technology Adoption

- The integration of IoT, blockchain, and predictive analytics should be accelerated to improve real-time monitoring, supply chain transparency, and operational efficiency.



Collaborative Initiatives

- Fostering collaboration among stakeholders, including government agencies, logistics companies, and technology providers, is essential for addressing common challenges, driving innovation and access to global best practices and advanced technologies.



Skill Development

Developing specialized training programs for cold chain professionals is vital to enhance technical expertise. Expanding access to training facilities in rural areas can bridge the skill gap and create a well-equipped workforce.



15. Tourism Infrastructure

Tourism sector in India: Overview

5.5%

Total (Direct + Indirect)
Share of Tourism in
National GVA

5.2%

Total (Direct + Indirect)
Share of
Tourism in National GDP

2.7%

Direct Share of
Tourism in
National GDP

13.3%

Total (Direct + Indirect)
Share of Tourism in
Employment

5.8%

Direct Share of
Tourism
in Employment

India has positioned itself prominently within the global tourism landscape, accounting for **1.4% of total international arrivals** and contributing **~2% to worldwide tourism receipts**.

In 2025, the **top 10** source markets for Foreign Tourist Arrivals (FTAs) in India were the **United States , United Kingdom, Australia, Canada, Bangladesh, Malaysia, Sri Lanka, Germany, Nepal, Japan**.

The gender-wise FTAs in 2025, reflected a **balanced gender distribution** among foreign visitors.

55% male tourists



45% female tourists



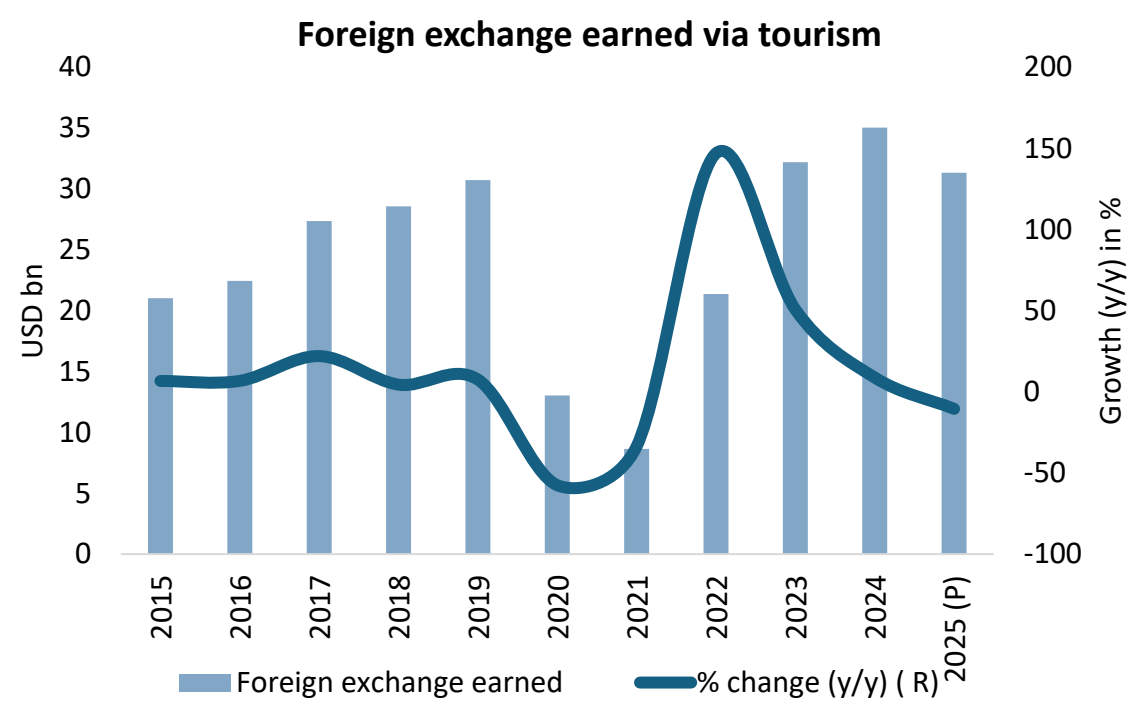
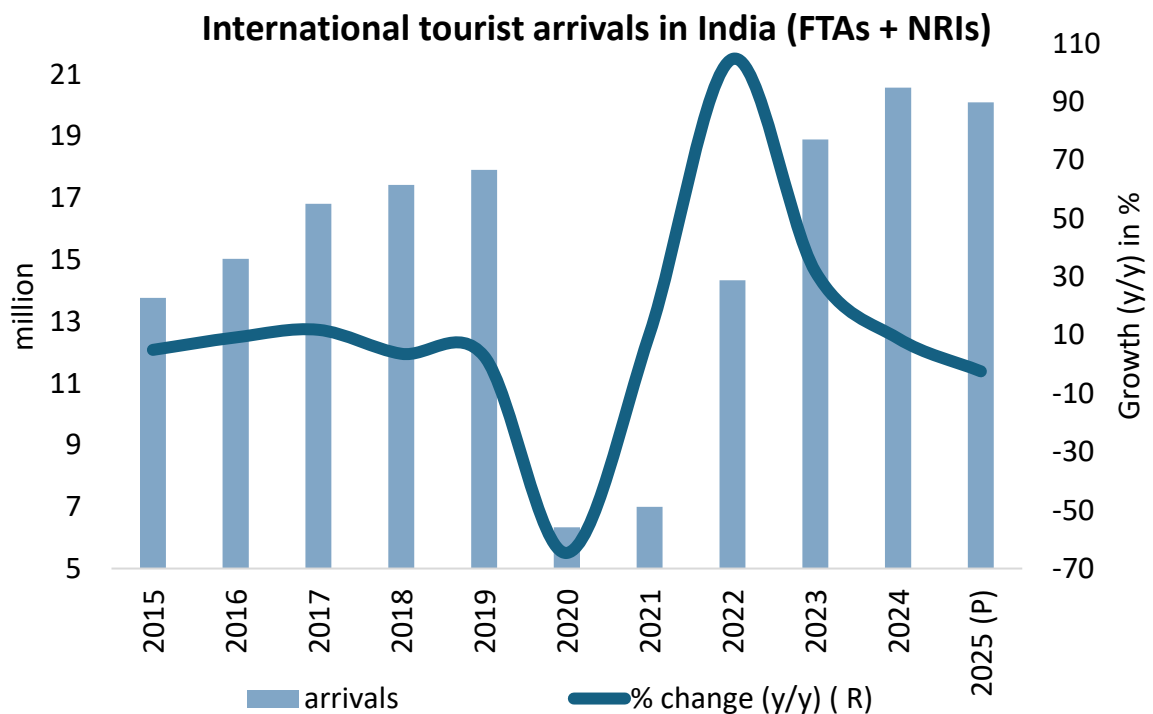
As per the Union Budget FY 2025-26, **top 50 tourist destination** sites in the country will be developed in partnership with states through a challenge mode. **Hotels in those destinations** will be included in the **infrastructure HML**

Season-wise FTAs in 2025 showed a clear **peak during December**, recording ~1.1 mn arrivals, the highest for the year, **with ~12% share of total FTAs**.

98% of Indian nationals departed by **air** for international travel in 2024. In comparison, **0.54% used waterways** and **1.46% travelled via land routes**,

Tourism sector in India : Analysis of Past trends in foreign tourist arrivals and forex earnings

- In 2025, (as of Dec'25) India recorded approximately 9 mn Foreign Tourist Arrivals (FTAs) whereas International Tourist Arrivals (ITAs) in India reached 20.1 million, reflecting a decline of ~2.4% over the previous year and a growth of ~11% compared to 2019.
- The purpose-wise analysis of foreign arrivals in 2025 shows that Leisure (39%), followed by Indian Diaspora (33%) and Business (12%) remained the top three dominant categories.
- In 2025, India's Foreign Exchange Earnings (FEEs) from tourism amounted to \$31bn, declining by (-)10.5% over \$35 bn in 2024. This accounted for approximately 2.02% of global tourism receipts, reaffirming the sector's significant contribution to the national economy and India's growing presence in the international tourism market.

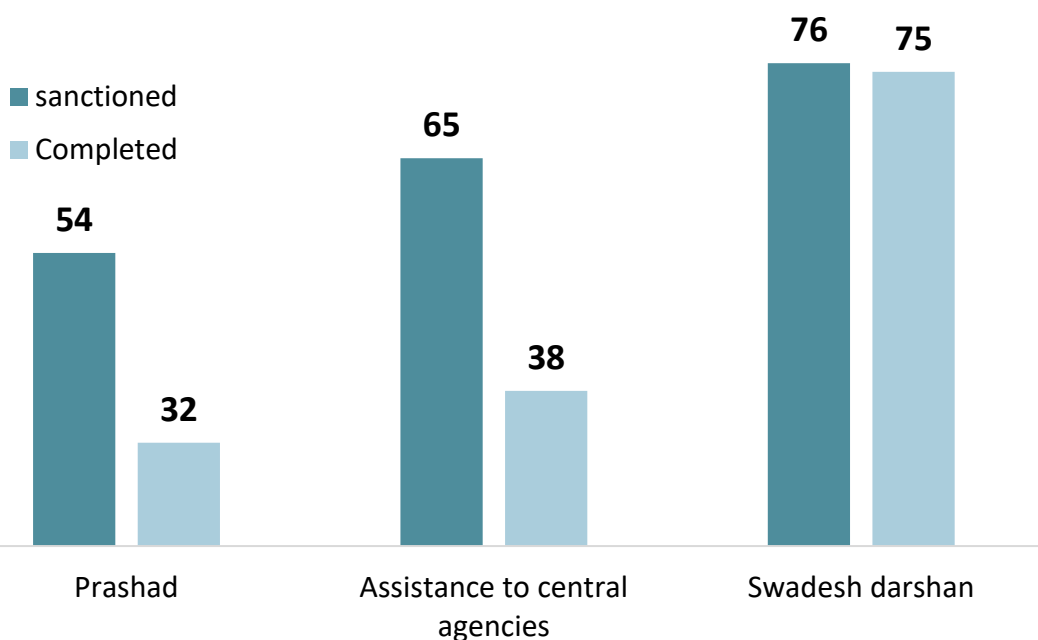


Source: Ministry of Tourism, NaBFID Economist

Tourism infrastructure development in India : focus on government schemes and progress till now

- In 2014-15, the Ministry of Tourism launched the Swadesh Darshan Scheme (SDS) to develop thematic tourism circuits across the country. 76 projects worth Rs5,290.30 crore were sanctioned under identified themes, of which 75 projects have been physically completed.
- This scheme has been revamped as Swadesh Darshan 2.0 (SD2.0) in 2023 to develop sustainable tourism destinations that take a tourist- and destination-centric approach. Under SD2.0, over the last two years, the Ministry has sanctioned 53 projects under SD2.0 for Rs.2208.31 Crore which are at different stages of implementation. (as of Mar'26) ¹Through Swadesh Darshan and Swadesh Darshan 2.0, 111 projects have been developed across various thematic circuits, including the Ramayana, Buddhist, Coastal, and Tribal circuits.
- In 2025, a total of 7 projects were sanctioned under the PRASHAD Scheme. Out of 54 sanctioned projects, 32 projects have been physically completed

Tourism Infrastructure development : project status*



Top performing countries in Travel and tourism Development Index by IMF WEF

Rank	Name of the country
1	US
2	Spain
3	Japan
4	France
5	Australia
6	Germany
7	UK
8	China
9	Italy
10	Switzerland
39	India

India's scores have improved in three areas

- Prioritization of travel & tourism
- Safety and security
- Health and hygiene

Source: *As of Dec'25 , 1. <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2238959®=3&lang=1>Ministry of Tourism, NaBFID Economist

Tourism infrastructure development in India : Project development under flagship scheme PRASAD

Projects Sanctioned under PRASAD Scheme



- The ‘National Mission on Pilgrimage Rejuvenation and Spiritual, Augmentation Drive’ (PRASAD) was launched by the Ministry of Tourism as a Central Sector Scheme .
- The key objectives of the scheme include **bridging infrastructural gaps in tourism**, to position **pilgrim and heritage tourism as major engine of growth**, improve quality of tourism services, enhance tourism attractiveness, promote local arts, crafts and culture, convergence of central and state government schemes , rejuvenation and spiritual augmentation and community based development.
- In 2025, 54 projects have been sanctioned across 28 States/UTs at a total sanctioned cost of Rs. 1726.74 Cr. Till date, an amount of Rs. 1200.47 Cr. has been released.
- 32 projects are physically completed, while 18 projects are under implementation and 3 projects are in tendering stage whereas 1 project is foreclosed.
- 16 New sites have also been identified for development under the PRASHAD Scheme in 12 States/UTs.

Growth and prospects of Tourism in India



To make India a global travel destination, India has set an ambitious target of a **\$3 trillion tourism economy by 2047.**

According to the World Travel & Tourism Council (WTTC) 2024–25 report, India is ranked 8th among the world's largest tourism economies, highlighting a strong post-pandemic recovery and a significant surge in both domestic and international travel

Two distinct generations of travellers are shaping the industry: Gen ACE and Gen LUX. **Gen ACE, under 40**, are adventurous, celebratory, and exploratory, often traveling with peers and influenced by social media.

Gen LUX, over 40, seek luxury, uniqueness, and experience, traveling with family and influenced by offers and vacation schedules.



With government's **@2047 vision targeting 100 million inbound tourists by 2047**, World Travel and Tourism Council projects the sector's GDP contribution to **potentially hit Rs 43.25 trillion by 2034**, supporting **nearly 63 million jobs.**

By 2027, India is expected to become the **fifth largest outbound market**, up from tenth in 2019.



The growth outlook is promising for Indian tourism, **with the industry projected to grow at 12% to 15% annually over the next five years.**

This growth is underpinned by an **expanding middle-income population, GDP growth**, a robust stock market and political stability.

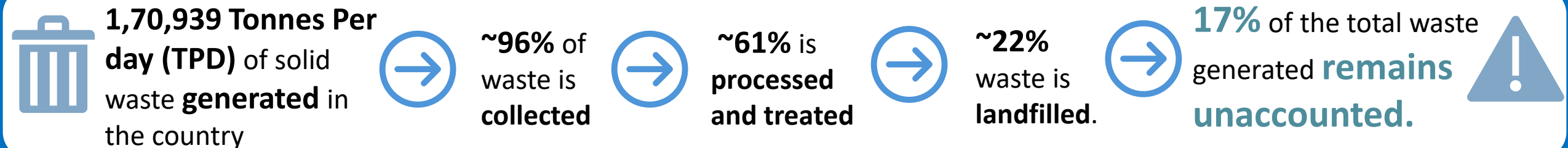
The National Digital Tourism Mission (NDTM) is set to further revolutionize the industry, particularly in niche sectors.





16. Solid waste Management Infrastructure

Solid waste Management in India : Overview



Composting and vermicomposting

are the most widely used system for management of organic wastes.

Biomethanation and biogas plants are also used for the management of **organic waste** across the country.

14

State/UTs ensure **100% collection of waste**, namely Andaman and Nicobar Islands, Andhra Pradesh, Bihar, Chandigarh, Chhattisgarh, DNH and DD, Gujarat, Ladakh, Lakshadweep, Puducherry, Sikkim, Tripura and UP.

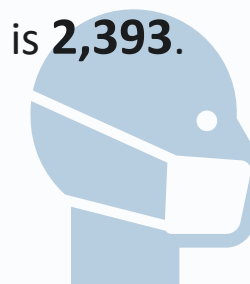
5

States/UTs practice **100% segregation at source**, namely Karnataka Chandigarh, Chhattisgarh, and Ladakh, Mizoram.

16

States/UTs have treatment/ **processing capacity of more than the national average** namely Andhra Pradesh, Lakshadweep, Tripura, Chhattisgarh, Andaman and Nicobar Islands, Madhya Pradesh, Goa, Kerala, Delhi, Himachal Pradesh, Odisha, Gujarat, Maharashtra, Telangana, Manipur and Daman Diu & DNH.

There are only **394 landfills in operation** and the total number of **existing dumpsites** in the country is **2,393.**



Economic feasibility for Waste to Energy (WTE) in India



Only **non recyclable non-biodegradable high-calorific-value waste** should be used as waste feed for WTE plants



As most of the waste sent to WTE plants is unsegregated, it has **high inert content**. **Not suitable** for burning in WTE plants.



To burn it, **additional fuel** is required.



Main reason why WTE plants in Kanpur, Bengaluru, Hyderabad, Lucknow, Vijayawada, Karimnagar etc. had to be **closed down**.



COMPOSITION OF WASTE

- Composition of waste acts as the fundamental determinant of feasibility of converting it into energy.
- Indian waste has a **very high** biodegradable fraction.
- **~40–70% of the total waste is biodegradable**—making it one of the highest in Indian waste.

CALORIFIC VALUE

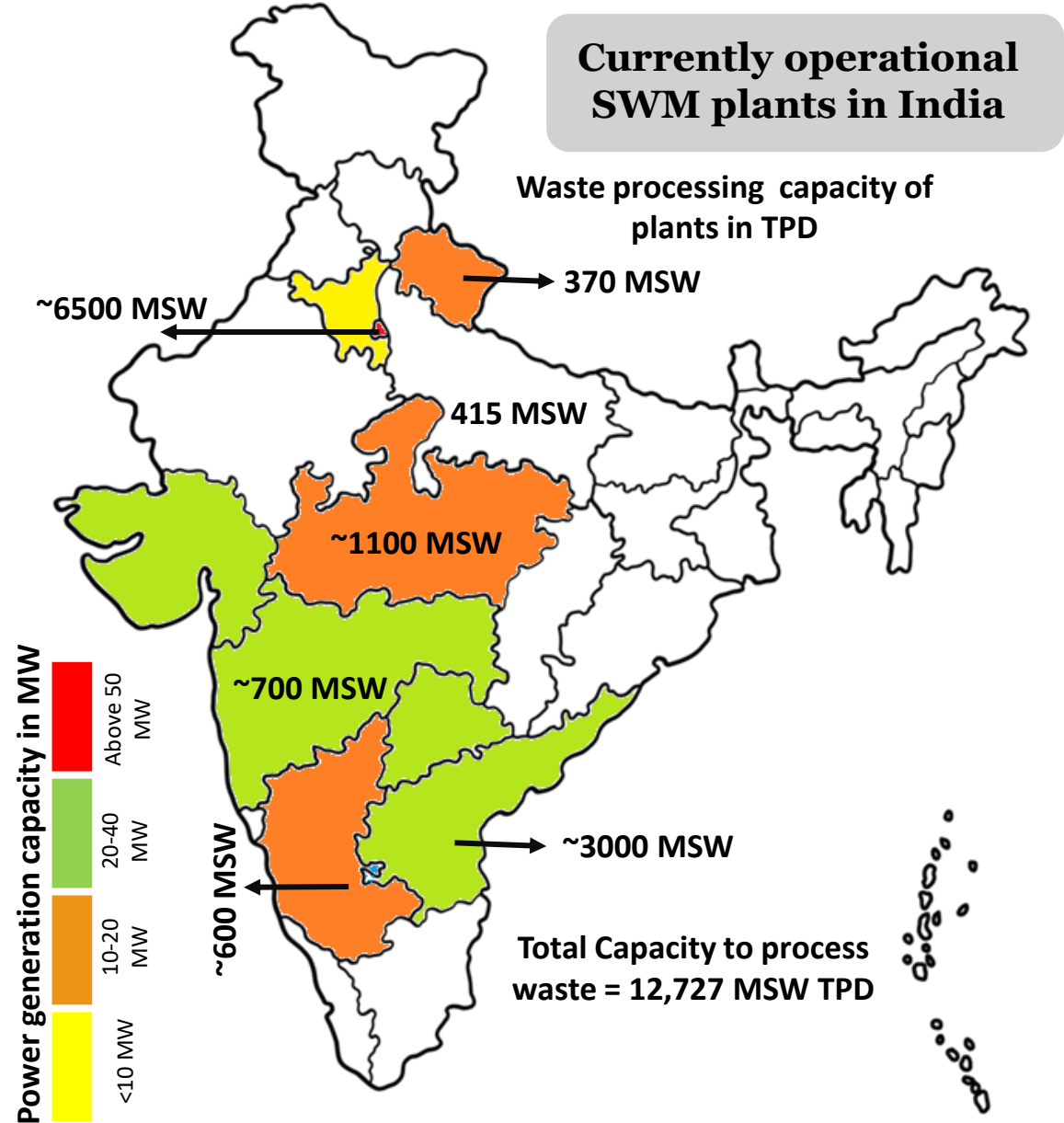
- Indian waste has low calorific value and high moisture content.
- The calorific value of garbage in Sweden, Norway, Germany and USA ranges between 1,900-3800 kcal/kg.
- in comparison the calorific value of waste in India is 1,411–2,150 kcal/kg- too low to burn

WTE IS EXPENSIVE DESPITE SUBSIDIES

- The financial subsidies/incentives take care of about **40% of the project cost**. Yet, the cost of electricity produced from these plants is the most expensive.
- **If these subsidies are removed**, the electricity produced from WTE plants will **not be affordable**.

Waste-to-energy plants operational in India : Current status of their power generation & waste processing capacity

Currently operational SWM plants in India



- Currently **21 Municipal Solid Waste (MSW)-based Waste-to-Energy (WtE) plants** are operational in the country, having a cumulative **installed capacity of 248.8 Megawatt (MW)** and a total **waste processing capacity of 12,727 Tonnes per day (TPD) of MSW.**
- Under the Waste-to-Energy Programme of MNRE, Biogas-to-Power projects utilizing the organic fraction of MSW are eligible for Central Financial Assistance (CFA) of **₹0.75 crore per MW, subject to a maximum of ₹5 crore per project.**
- Under Swachh Bharat Mission -Urban 2.0 being implemented by the MoHUA, additional Central Assistance (ACA) is **available to ULBs at the rate of Rs.18 crore/ 100 tonne per day for setting up of waste to energy. Viability Gap Funding (VGF) (25-50%)** is allowed as per the operational guidelines of SBM-U 2.0.
- Ministry of Environment Forest and Climate Change has notified the Solid Waste Management Rules, 2016. Duties and responsibility of various agencies have been stipulated in the said rules for proper and scientific management of Solid Waste.

Source: Ministry Of New And Renewable Energy, NaBFID Economist; Data as on August 12, 2025

Waste-to-energy plants in India : Issues and concerns

- Currently, only 96% of the total waste generated is being collected, leaving 4% uncollected.

- There is a 17% shortfall in the overall management of solid waste, amounting to an estimated 28,576 (TPD).

- On avg, only 61 % of waste is processed and treated nationwide. Effectiveness of SWM differs widely among states and UTs.

- 21 report a gap of < 10% between waste generated and waste managed.

- Another 10 face significant challenges, with gaps >20%. While 11 states/UTs have developed the capacity to process >80% of their waste, ~8 states lag with <25% of total waste output treated.

- The State of Nagaland has no dedicated facilities for the treatment/ processing of wastes. In Puducherry & Chandigarh, about 85 % and 77 % of their waste is disposed through sanitary landfill respectively.

- States like Nagaland, Bihar Arunachal Pradesh, and West Bengal have large untreated waste quantities.

- The ratio of dumpsites to sanitary landfill is in excess of 6 indicating that the number of dumpsites is approx. 6X the number of sanitary landfills

- Only 377 out of 2,474 dumpsites have been reclaimed and another 44 have been converted to sanitary landfills. The disposal of waste through open dumpsite is not a recognized system as per the Solid Waste Management Rules, 2016

- Data on solid waste management provided by State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs) is often incomplete and inconsistent.

- Lack of reliable information hinders an accurate understanding of on-ground conditions, making it difficult to design effective strategies and interventions to address existing challenges in the waste management system.

Waste-to-energy plants in India : Recommendations and solutions

- As per the Solid Waste Management Rules, 2016 the responsibility of collection of solid wastes lies with the local bodies.
- Therefore, the local bodies must expedite the development of infrastructure for ensuring 100% collection of waste

- Additionally, responsibility for construction, operation and maintenance of solid waste processing facilities lies with the local authorities.
- The local bodies need to expedite the development of infrastructure for the processing/ treatment and the final disposal of solid wastes.
- Further, adoption of technologies such as incineration, waste to energy, biogas plants, etc should also be expedited.

- Disposal of waste through open dumpsite is not an approved system.
- Local bodies along with the state government should introduce systems which will ensure processing/treatment and disposal through approved system while also reclaiming the areas under the existing dumpsites

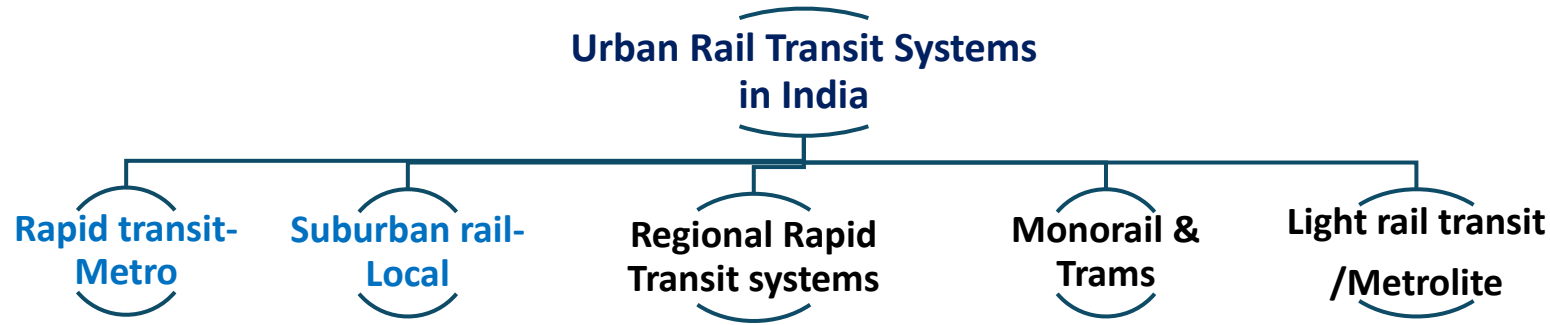
- The overall responsibility of enforcing the Rules lies with the SPCBs/ PCCs as per the Solid Waste Management Rules, 2016.
- SPCBs/ PCCs should follow stringent mechanism to review the implementation of provisions of the Rules. Periodic review with relevant departments should be conducted.

- To gauge the actual scenario of the status of solid waste management, the data submitted by SPCBs/ PCCs have to be complete and accurate.
- Therefore, there is a need to validate the data submitted by the local authorities to ensure its authenticity & consistency prior to submitting to CPCB. This could be done through random inspection, cross-checking of data or any other mechanism found suitable for the purpose.



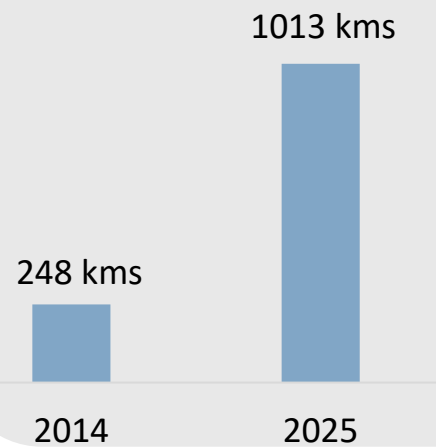
17. Urban Rail Transit Infrastructure

Urban Rail Transit System in India : Overview

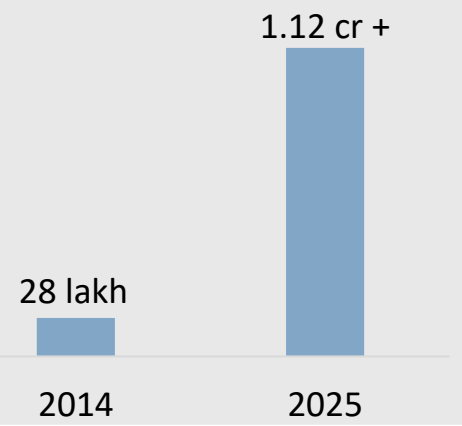


- India’s operational metro network has soared from **248 km across 5 cities** (in 2014) to **1,090 km across 26 cities (2025)**, adding 763 km in just 11 years.
- Region-wise nearly **60% of this length** is concentrated in **Delhi-NCR and Maharashtra** which accounts for around 450 km and over 170 km, respectively.
- Average daily ridership has climbed from **28 lakh (2013–14)** to **over 1.12 crore (2024-25)**, marking a transformative shift in urban commuting.
- The pace of commissioning new lines has **accelerated ninefold**: from **0.68 km/month (pre-2014)** to approximately **6 km/month today**.

Metro rail network

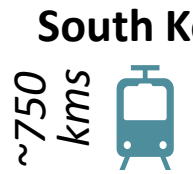
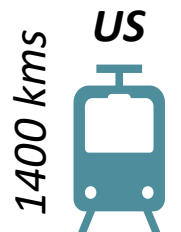


Daily ridership



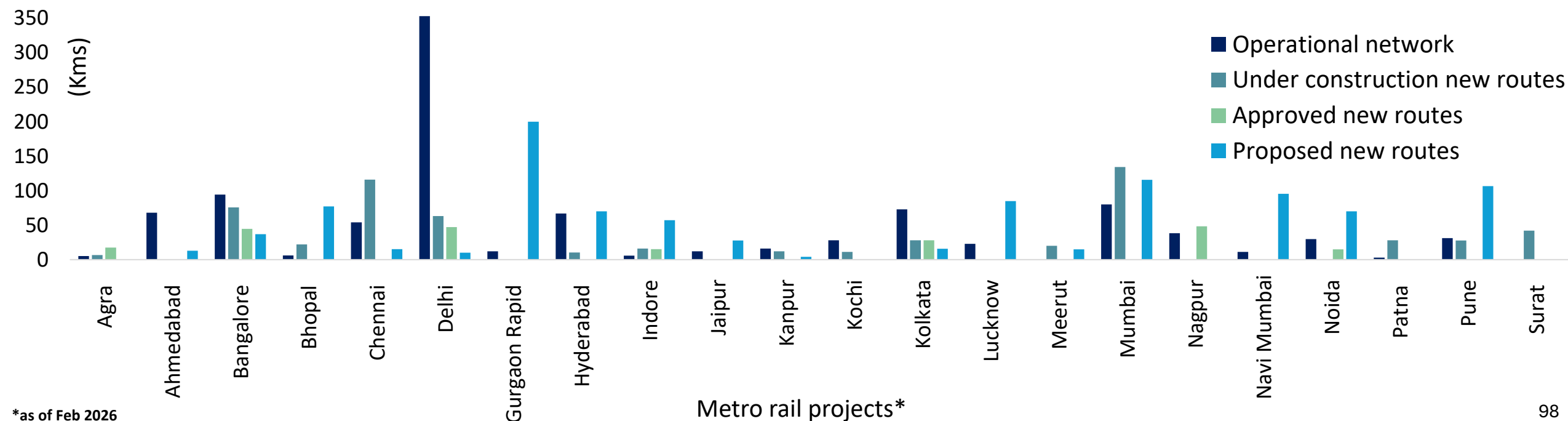
- The first phase of the Bhopal Metro, the Orange Line Priority Corridor, was inaugurated on 23 December 2025. The priority corridor spans approximately 7 km and comprises eight elevated stations, namely AIIMS, Alkapuri, DRM Office, Rani Kamlapati, MP Nagar, Board Office Chauraha, Kendriya Vidyalaya, and Subhash Nagar.

Biggest metro networks in the world



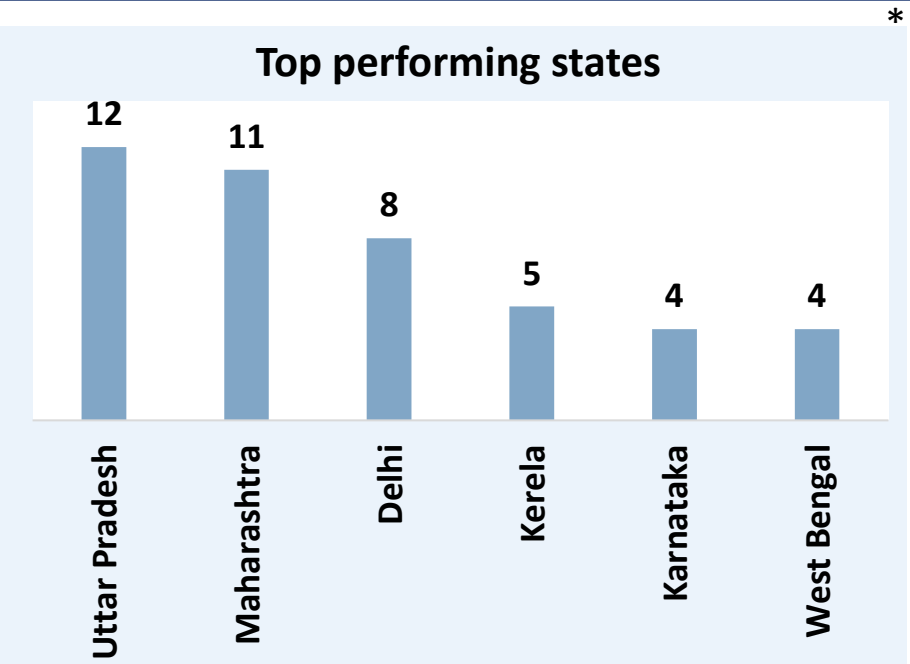
Progress of metro system in Indian cities

- From January 2025 to date (29.11.2025), about 85.62 km of new metro rail lines have been made operational across the country, contributing significantly to this year's progress. Delhi tops the list with an extensive 353 km metro network, followed by Bengaluru (94 km), Mumbai (80.2 km), and Kolkata (74 km). Several newer and smaller systems, such as those in Nagpur, Lucknow, and Pune, are also expanding rapidly.
- As a result, average daily ridership has surged fourfold over the past decade, rising from 28 lakh in 2014 to 1.12 crore in 2025. The Delhi Metro alone moves about 65 lakh passengers on weekdays, while Bengaluru carries roughly 10 lakh and Mumbai about 8.5 lakh commuters each day. Kolkata, one of the country's oldest metro networks, serves over 6 lakh passengers daily and, in 2024, introduced India's first underwater metro tunnel.
- Systems in cities like Pune (2.18 lakh daily riders), Chennai (3.19 lakh), and Hyderabad (4.7 lakh) are experiencing consistent growth. Smaller metros, including those in Lucknow, Nagpur, and Jaipur, record between 0.5 and 1.5 lakh commuters per day.



*as of Feb 2026
Source : The Hindu, <https://themetrorailguy.com/metro-rail-projects-in-india/>

Current Financing and funding scenario of Metro Projects in India

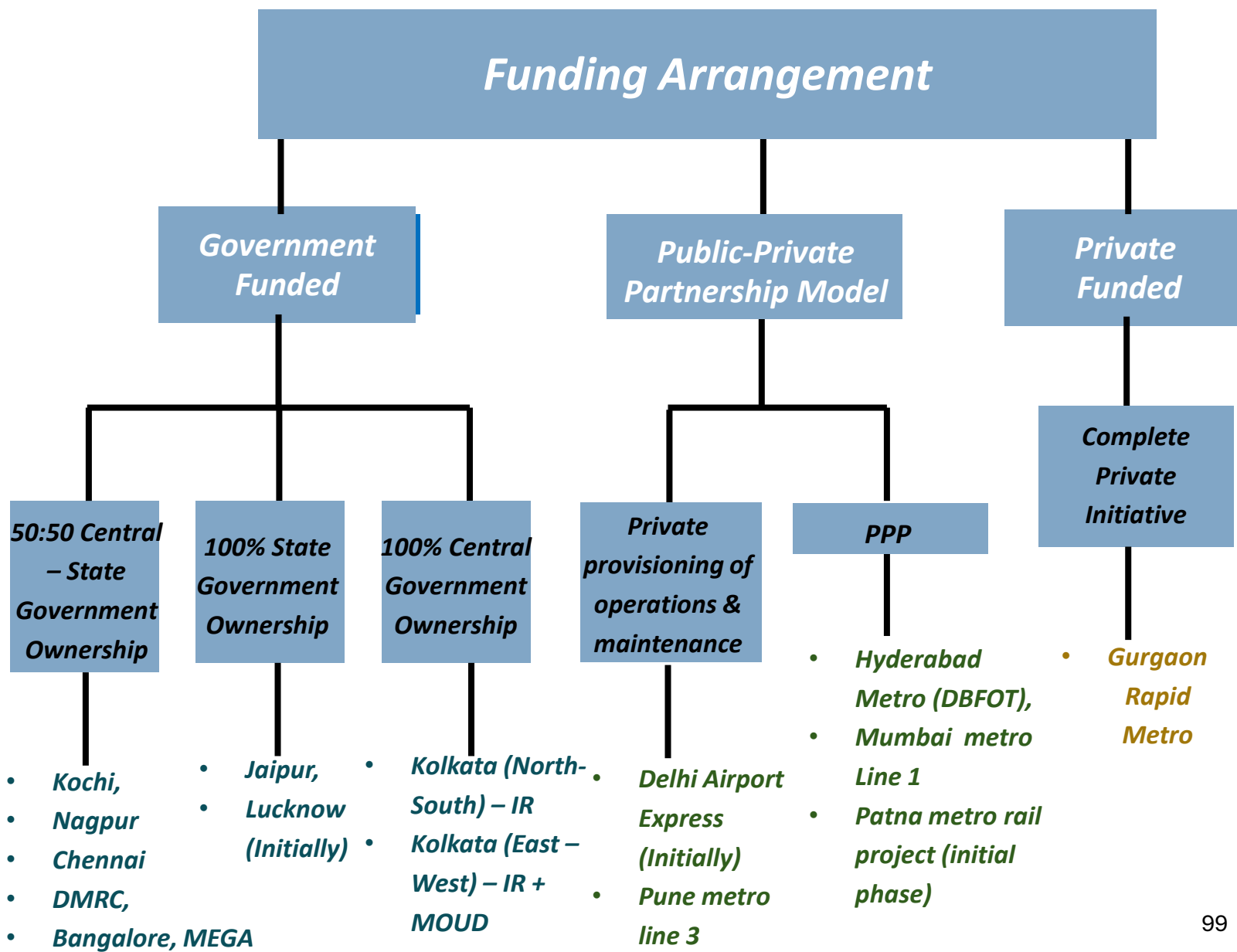


60 Opportunities worth **USD 76 bn**

PPP models are likely to face limited viability in URTS due to weak revenue potential.

Mode of implementation

47 EPC 10 to be finalized 2 PPP 0 Pure private



*as per India investment grid (as of April 5th 2026)

Progress of metro system in Indian cities

	Institution / Lender	Key Metro Projects Financed / Supported in India
1	Japan International Cooperation Agency (JICA)	<ul style="list-style-type: none"> • Recently extended a loan of INR 4,649 crore for the Delhi Metro — Phase 4 additional corridors. • Loan agreements signed (2024) for Mumbai Metro Line 3 and parts of Delhi Mass Rapid Transport System (Phase 4) under Japanese ODA
2	Asian Infrastructure Investment Bank (AIIB)	<ul style="list-style-type: none"> • Approved financing of USD 438.75 million for Chennai Metro Rail Phase 2 — Balance Corridor 5 • For Corridor 4 of Chennai Metro Phase 2 (Lighthouse ↔ Poonamallee Bypass), co-financing along with other agencies • The bank has also “evinced interest” (as of May 2025) to fund new metro-projects in Visakhapatnam and Vijayawada
3	European Investment Bank (EIB / EIB Global)	<ul style="list-style-type: none"> • Provided a €450 million loan for Agra Metro (two interconnected lines ~30 km, 27 stations). • In 2025, extended €240 million loan for Nagpur Metro extension and €49.5 million loan for Pune Metro. <ul style="list-style-type: none"> • Historically gave €500 million to build the 23 km “Reach 6” line of Bengaluru Metro. • Also funding suburban rail upgrade in Bengaluru (via a €300 million loan) tied to metro/urban transport upgrades.
4	Asian Development Bank (ADB)	<p>Part of funding consortium for Chennai Metro Phase 2 (Corridor 4, Balance Corridor 5 etc.), along with AIIB and other agencies</p> <p>Provided ₹1,527 crore to Nagpur Metro Phase II — part of a larger ₹ 3,586 crore loan-package (with EIB) for that phase.</p>
5	KfW Development Bank (Germany / German agency)	<ul style="list-style-type: none"> • Provided a promotional loan of €500 million (≈ Rs 3,750 crore) to co-finance 1st phase of the Nagpur Metro project (city’s 1st metro). • The loan covered ~half of the project cost: total cost ~€1.24 billion (or Rs ~8,680 crore) for the metro; with rest was flowing central/state & municipal funding.
6	Agence Française de Développement (AFD, France)	Contributed funding for the first phase of Nagpur Metro — as part of the co-financing alongside KfW.
7	New Development Bank (NDB, formerly BRICS bank)	For the ongoing Chennai Metro Phase 2 financing plan, NDB is listed (along with AIIB, ADB) as one of the multilateral lenders/financiers.

Policy enablers for progress of metro system in Indian cities



Metro Rail Policy, 2017

- Requires cities to create Comprehensive Mobility Plans (CMPs).
- Calls for the establishment of Urban Metropolitan Transport Authorities (UMTAs).
- Provides a framework for planning and guiding metro system development.
- Metro projects must achieve a minimum Economic Internal Rate of Return (EIRR) of 14% to receive central financial assistance.
- Mandatory private sector involvement is required through Public-Private Partnership (PPP) models.



Make in India for Metro Rail Systems

- The government has made provisions for domestic procurements of at least 75% of metro cars and 25% of key equipment and sub-systems
- In the last 10 years, India has invested nearly ₹2.5 lakh crore (US\$ 28.86 billion) into expanding its metro network. Bharat Earth Movers Limited (BEM), a PSU under the Ministry of Defence, has supplied over 2,000 metro coaches as of May'24.



Global Partnerships

- Mumbai Metro Line 3 (MML-3) features investment worth ₹23,136 crore (US\$ 2.67 billion), with JICA-Japan International Cooperation Agency funding 57.2% of the investment at ₹13,235 crore (US\$ 1.53 billion) as loan assistance.
- The remaining comes from the Government of India and Maharashtra State Government /MMRDA, exemplifying global-domestic infrastructure ties.



Green Urban Mobility

- The Delhi Metro installed a vertical bi-facial solar plant on an elevated viaduct at Okhla Vihar and a 1 MW rooftop solar plant at Khyber Pass depot, pioneering land-free renewable energy use.
- Many metro stations in cities like Delhi, Kochi, Nagpur, and Pune have received Indian Green Building Council (IGBC) Certifications, promoting eco-friendly infrastructure.



18. Sports Infrastructure

Sports Infrastructure in India: Overview & Recent Trends

Definition:

Sports infrastructure is defined as the primary physical and organizational construction needed to facilitate sport participation.

India is witnessing the initial phase of a profound transformation in sports infrastructure, driven by a powerful confluence of public investment, growing consumer demand, and a nascent private sector eager to capitalize on this untapped market.

Market Size:
INR 23,000 crore
 (USD 2.7 billion)

*The push for Sports Infra is strongly supported by states like **Odisha, Gujarat, Haryana & Tamil Nadu** which are leading investors in new sports facilities.*



DEMAND DRIVERS: Why Sports Infrastructure is India's Next Big Investment Frontier?



Demand from new-age buyers: Increase in health-consciousness post-pandemic with people demanding fitness centres, swimming pools, and community spaces.



Flagship programs like Khelo India, Fit India Movement, Khelo Bharat Niti 2025, etc.



Real Estate Integration: Developers launching "sports-centric townships" with high-end amenities.



Global Event Hosting: Active preparation for major events like the 2030 Commonwealth Games and a potential 2036 Olympics bid drives significant upgrades to sports infrastructure.



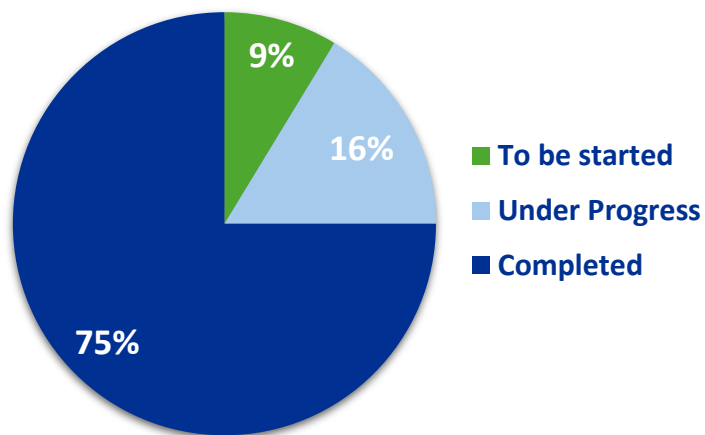
Growing Private Sector Participation: Emergence of pay and play turfs, and new sports like futsal and pickleball.

Sports Infrastructure in India: Government's Push

Khelo India Scheme:

- **Khelo India was launched in 2017-18** to promote mass participation and sporting excellence in both rural and urban areas.
- The revised Khelo India Scheme (2021-22 to 2025-26) contains **“Creation and Upgradation of Sports Infrastructure”** as one of its five components.

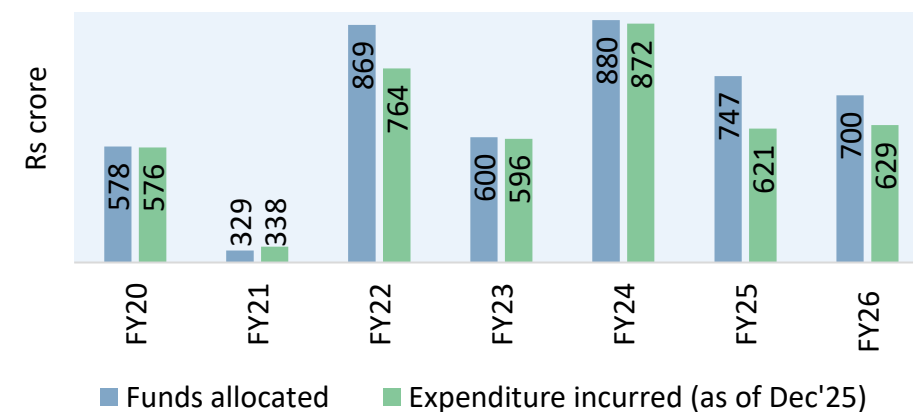
Infrastructure Projects Status Under Khelo India Scheme (as of Feb'26)



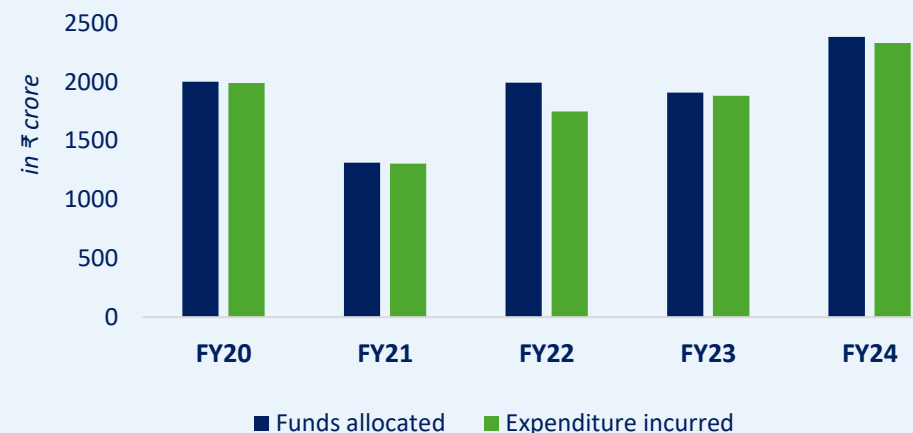
Creation and Upgradation of Sports Infrastructure

- The Scheme aims to provide support to both **Greenfield and Brownfield sports infra projects**, provided they aim at bridging critical gaps in sports infrastructure to meet existing demands.
- The scheme will **provide capital** to States/ UTs, the Sports Authority of India (SAI) under the Ministry of Youth Affairs and Sports and other eligible entities such as Central/State educational institutions, Defense/Paramilitary organizations, etc.
- 344 new sports infrastructure projects were approved under the scheme. Out of this 258 have been completed, 57 are in progress and 29 are yet to be started. (as of Feb'26)

Funds allocated and expenditure incurred under the Khelo India Scheme



Funds allocated and expenditure incurred under various sports promotional schemes



Sports Infrastructure in India



Challenges for Sports Infrastructure in India

- **Limited funding for different sports:** Cricket dominates Indian sports funding, stifling growth other sports.
- **Lack of maintenance** of existing infrastructure.
- **Substandard school & college facilities** which block students from receiving critical early training.
- **Geographical Concentration:** High-quality infrastructure is concentrated in cities, while rural and tribal regions lack even basic playing fields.
- **Inadequate utilization of existing infrastructure** due to high cost of private facilities, administrative hurdles, restricted public access.
- **Quality Issues:** Only 10.4 per cent of India's mapped and completed sports infrastructure meets Olympic standards.



Opportunities for development of Sports Infrastructure in India

- **Increase in Fitness Awareness:** Growing health consciousness opens avenues for private players to invest in community sports arenas and wellness parks.
- **Hosting global events:** India's ambition to host international sporting events creates opportunities for large-scale investments in stadiums and training centers.
- **Transformation in Education Sector:** NEP emphasizes holistic development, which specialized training facilities in educational institutions.
- **Sports Tourism & Real Estate:** Investors can explore sports-centric real estate projects that combine training facilities with hospitality and leisure.
- **High-Performance Training Centers:** Private players can establish elite training academies for professional sports.

Sports Infrastructure Development in India: Government, Private, and PPP Models



High Performance Centres in Odisha: Built through PPP Model

The Odisha State Government teamed up with the corporate sector to set up 10 High-Performance Centres (HPCs) across various sports. Each HPC is supported by two private stakeholders: a corporate sponsor and a technical service provider responsible for delivering specialized sports training.

- Hockey - Tata Steel & Naval Tata Hockey Academy (NTHA)
- Badminton - Dalmia Cement Ltd & Pullela Gopichand Badminton Foundation



Shaheed Veer Narayan Singh International Cricket Stadium: Built by Government of Chhattisgarh

- Work on the stadium began in 2006 and concluded two years later, incurring an expense of ₹145 crore.
- In terms of seating capacity, it is the third-largest cricket stadium in India.
- In Nov'25, the management of the stadium was given to the Chhattisgarh State Cricket Sangh (CSCS), a BCCI-recognized private organization.



Inspire Institute of Sport (IIS), Vijaynagar Karnataka: Built by JSW

- A sports academy funded and operated by JSW Sports: privately financed and managed. The institute, established by Parth Jindal of Jindal Steel, was built at a cost of ₹100 crore.
- The institute focuses on multiple sports like boxing, wrestling, judo, and provides physiotherapy and recovery facilities.

Sports Infrastructure in India: Conclusion

Key Stakeholders in Building Sports Infrastructure



Central government

National Centres of Excellence, Khelo India facilities, SAI stadiums.



State governments

State-owned stadiums, regional academies (e.g.: Odisha, Tamil Nadu, Gujarat, Haryana)



Municipal authorities

Community grounds, multipurpose halls, public swimming pools.



Private corporates

Franchise-owned stadiums, academies, commercial complexes.



Schools and colleges

Dedicated facilities for cricket, football, athletics, basketball, badminton



Municipal authorities

Community grounds, multipurpose halls, public swimming pools.



Residential Authorities

In-house courts and gyms driving community fitness



Commercial spaces

Pay-and-play turfs, indoor arenas, and fitness centers.

Way Forward:

What can be done for advancing India's sports infrastructure?

1. **Leveraging PPPs** to gain private funding, superior technology, and professional management standards.
2. **Direct investment towards Tier 2 & Tier 3 cities & rural regions** to bridge the urban-rural infrastructure disparity.
3. **Fostering partnerships among stakeholders** (schools, societies, private operators) to boost usage & revenue.
4. **Education Integration** to implement NEP's vision by making sports mandatory in schools and colleges.
5. **Building integrated sports cities** with accommodation, transport, and entertainment facilities.

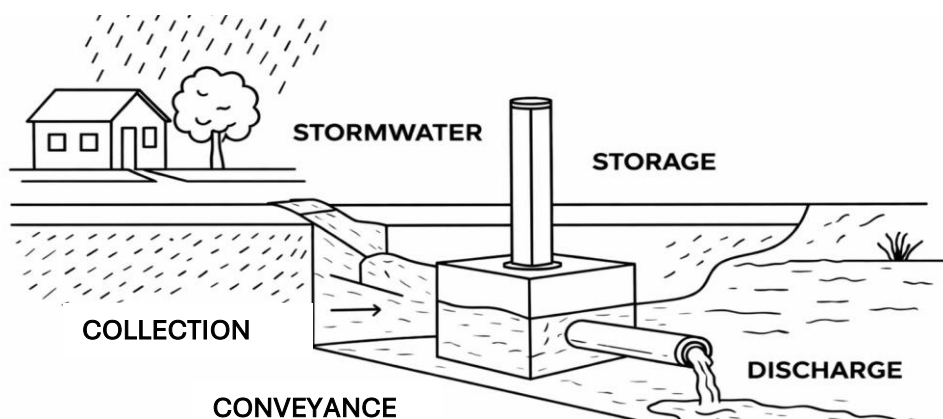


19. Storm Water Drainage Infrastructure

Storm Water Drainage Infrastructure in India: Overview

What is a Storm Water Drainage System?

It refers to the constructed and natural features which function together, as a system, to collect, convey, channel, hold, inhibit, retain, detain, infiltrate, divert, treat or filter storm water. Storm water is the portion of precipitation that does not naturally percolates into the ground or evaporate, but flows via overland flow, interflow and pipes.



Market Size:



India's stormwater management market is projected to witness a **CAGR of 9.67%** during FY25-FY32, growing from **USD 402 million in FY24** to **USD 842.93 million in FY32**.

India's stormwater drainage network currently covers approximately **20%** of the road network. *(as of the 2011 census).*

Process of Stormwater Drainage Systems:

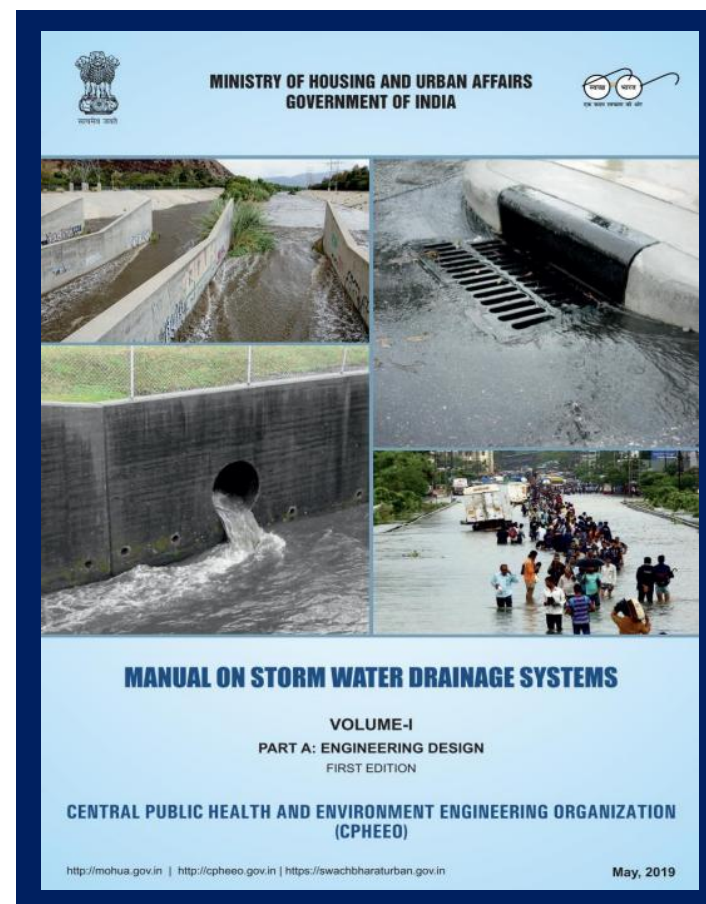


Storm Water Drainage Infrastructure in India: Government Support

- The **AMRUT (Atal Mission for Rejuvenation and Urban Transformation)** scheme was launched in 2015 to focus on enhancing basic urban infrastructure in selected cities and towns. Later, AMRUT 2.0 scheme was launched in 2021 for the period of 05 years.
- AMRUT 2.0 was aimed at:
 1. **Universal coverage of water supply through functional taps to all households in all the statutory towns in the country**
 2. **Coverage of sewerage/septage management in 500 cities covered in the first phase of the AMRUT scheme.**

Under AMRUT 2.0, provisions have been made to harvest rainwater by channeling stormwater through drains into water bodies that do not receive sewage or effluent, along with the creation and strengthening of stormwater drains around water bodies.

- **Ministry of Housing and Urban Affairs (MoHUA) has issued:**
 1. **Standard Operating Procedures on Urban Flooding, 2017**
 2. **Manual on Storm Water Drainage Systems, 2019** to assist the States/UTs, Urban Local Bodies & other stakeholders on planning, design, operation and maintenance of storm water drainage systems.
- Storm water drainage system is a part of the harmonized list of Infrastructure sub-sectors under water sanitation infrastructure.



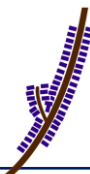
Storm Water Drainage Infrastructure in India: Importance of Stormwater Drainage in Indian Cities

Why Stormwater Drainage Systems are the need of the hour in Indian Cities?

Annual pluvial flood-related losses in Indian cities can amount to **\$5 bn by 2030** and \$30 bn by 2070 (World Bank)

Investments of over **\$2.4 trillion by 2050** will be needed to meet the need for new, resilient & low-carbon infrastructure & services in cities.

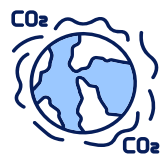
Drivers of Poor Stormwater Drainage Performance in India



Encroachment & Improper ribbon development : unplanned, linear construction along highways and roads significantly causes urban flooding in India by encroaching on natural drainage, reducing permeable surfaces, and overwhelming outdated infrastructure. Also, the high costs associated with constructing RCC drains and earthen drains significantly weaken incentives to undertake such development.



Outdated Urban Drainage Designs: Indian cities were designed for **12–20 mm/hr** rainfall, but today major cities like Mumbai, Kolkata, and Bhubaneswar frequently experience over **50 mm/hr**, making the old systems inadequate.



Climate Change

Climate change worsens stormwater drainage problems because it increases rainfall intensity & frequency. Rising temperatures also intensify storms, leading to frequent overloading of drainage systems.



Poor Planning of Cities

Unplanned urbanization replaces permeable land with concrete, blocks natural drains, encroaches on waterways, and overwhelms old drainage systems, causing clogged drains, waterlogging, and frequent flooding.



Neglected drain maintenance:

Silt, debris, and waste clog chambers, cutting drainage capacity. A good design is ineffective if the system is choked.

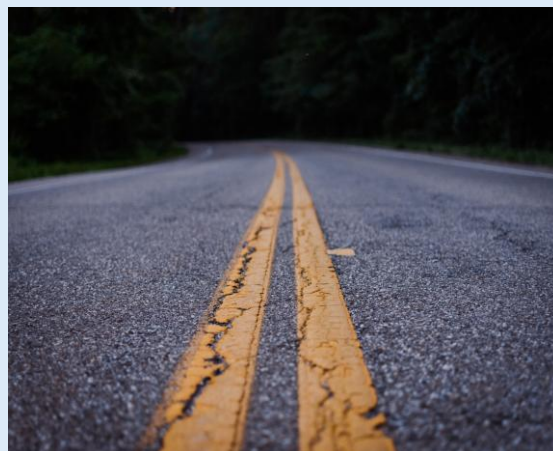
Storm Water Drainage Infrastructure in India

Problems associated with improper drainage of storm water



Frequent flooding & waterlogging

Improper stormwater drainage causes rainwater to accumulate on roads and low-lying areas, leading to frequent flooding and prolonged waterlogging that disrupts normal life.



Infrastructure Damage

Waterlogging weakens roads & public transport systems. Constant exposure to water causes cracks, potholes, and power outages, increasing repair costs and reducing urban mobility.



Health & Sanitation

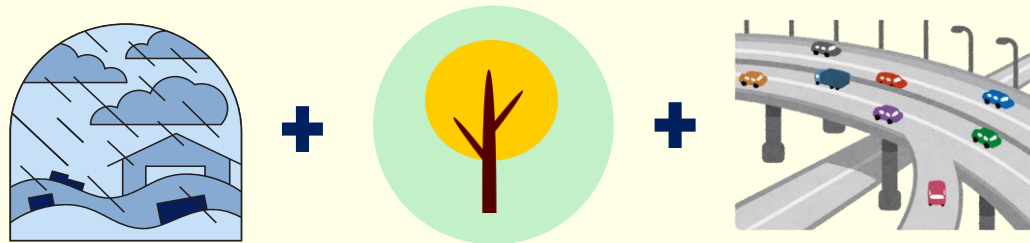
Stagnant rainwater becomes breeding grounds for mosquitoes and bacteria. This increases diseases like dengue, malaria, and cholera, making efficient drainage essential for public health & hygiene.



Economic Impact

Flooding disrupts businesses & daily activities, causing financial losses as repair costs rise, making strong storm water drainage vital for sustainable urban growth.

Storm Water Drainage Infrastructure in India: Way Forward



Blue-Green and Grey Infrastructure for solving the problem of Urban Flooding

It refers to the use of natural systems (blue and green infrastructure) to absorb and store stormwater in tandem with the traditional grey infrastructure. Together, they mitigate flood risk, reduce long-term maintenance costs, and enhance the overall quality and functionality of the urban environment.

- The **“blue”** component refers to surface & groundwater elements such as rivers that store & cleanse water.
- The **“green”** component involves vegetation and soil systems such as trees, green roofs, and permeable surfaces that absorb rainfall, reduce runoff and cool urban areas.
- The **“grey”** component includes built infrastructure like drainage networks, roads, flood defenses, and water treatment facilities that provide reliability, capacity, and structural control.

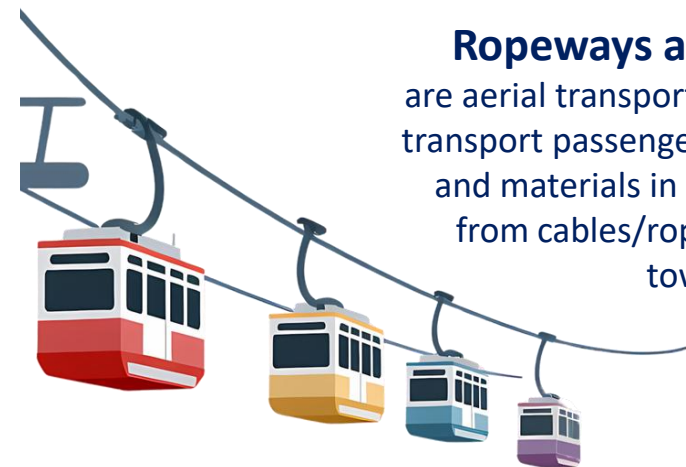
What needs to be done?

- **Adequate & sustained investment** is critical for improving stormwater management in Indian cities. Stormwater infrastructure has historically received far less funding than roads, water supply, and sanitation. Significant capital investment is required for upgrading drain capacity, restoring water bodies, deploying monitoring technology.
- **Separate drainage and sewerage systems**
Cities should maintain distinct systems for stormwater and sewage, ensuring that wastewater is conveyed to treatment facilities while stormwater is managed through dedicated drains to prevent pollution.
- **Regular maintenance:** Routine inspection, cleaning, and enforcement against illegal dumping are essential to prevent blockages and reduce the risk of flooding.
- **Sustainable urban drainage systems:** Measures such as rainwater harvesting, permeable pavements, river restoration, and green infrastructure help manage runoff and reduce urban flooding.
- **Stronger policies and enforcement:** Clear regulations, proper infrastructure standards, and effective governance are necessary to improve sewage and stormwater management outcomes.

A photograph of a cable car (gondola) suspended from a metal tower. The scene is set against a sunset sky with warm orange and yellow tones. Below the cable car, a cityscape is visible, partially obscured by a semi-transparent white banner. The tower's structure is a complex lattice of metal beams.

20. Ropeways & Cable Cars Infrastructure

Ropeways and Cable Cars Infrastructure in India: Overview



Ropeways and Cable Cars

are aerial transportation systems which transport passengers, freight containers and materials in carriers suspended from cables/ropes, supported by towers.

Global Comparison

- **France:** >4000 ropeway projects
- **USA:** >2000
- **Austria:** >2000
- **Switzerland:** 1700
- **India:** ~70 operational projects

India's ropeway and cable car infrastructure remains significantly underdeveloped compared to many other countries where such systems are integrated into mainstream transport networks. With the right investment, ropeways have the potential to become a transformative mobility solution for both remote terrains and rapidly growing cities.

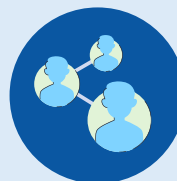
Key Drivers Behind Ropeway Infrastructure Development



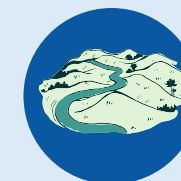
Provide direct aerial routes bypassing winding roads, tunnels, and switchbacks.



Ability to manage steep gradients better than roads or railways that require switchbacks or tunnels.



Provide last-mile connectivity by moving passengers access to remote or elevated locations.



Provide flexibility as they can transport passengers and different types of materials.



Cost-Effective as they require minimal ground infrastructure which significantly reduces associated costs.



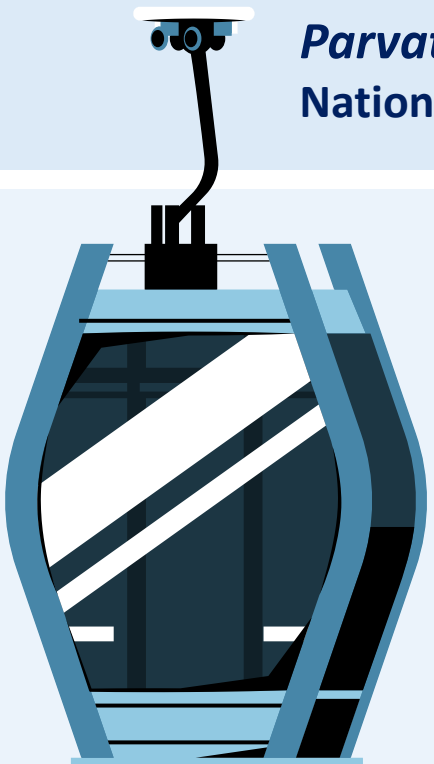
Environment friendly because of electric systems; produce low emissions and minimal dust.



Ideal for Difficult and Sensitive Terrain as they can cross rivers, valleys, buildings, and roads without requiring continuous ground infrastructure.

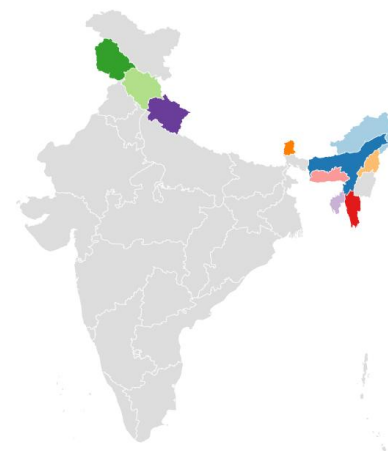
Ropeways and Cable Cars Infrastructure in India: Government Support

Parvatmala Pariyojana: National Ropeways Development Programme



- Announced by Union Finance Minister Smt Nirmala Sitharaman in the Union Budget for **2022-23**.
- The programme will be taken up in **Public-Private Partnership mode**.
- The goal is to:
 - **Develop >250 ropeway projects covering 1,200 km within five years**
 - **Provide a sustainable and efficient alternative to conventional road transport.**
- Will be implemented by **National Highway Logistics Management Limited (NHLML)**
- In line with the **'Make in India' initiative**, the programme requires that at **least 50% of the components used in ropeway construction be sourced domestically.**

Scope of the Parvatmala Programme:



Widespread Implementation:

The scheme will be covering states like Uttarakhand, Himachal Pradesh, Jammu & Kashmir and the North-East.

- **Urban and Rural Connectivity:** Supports daily commuting in rural areas and tourism hotspots.
- **Reduced Congestion:** Offers an alternative transport mode in crowded locations.
- **Employment Opportunities:** Generates jobs in construction, operation, and maintenance.
- **Economic Growth:** Strengthens local businesses and allied industries.

Ropeways and Cable Cars Infrastructure in India: Government Support

Projects under the *Parvatmala Pariyojana:*



Sonprayag-Kedarnath Ropeway Project

- 12.9 km ropeway project from Sonprayag to Kedarnath (12.9 km) in Uttarakhand.
- Based on Tri-cable Detachable Gondola (3S) technology with a cost of ₹4,081.28 crore.
- Will reduce travel time in one direction from about 8 to 9 hours to about 36 minutes.
- Will have the capacity of 1,800 passengers per hour per direction (PPHPD) carrying 18,000 passengers per day.

Govindghat to Hemkund Sahib Ji Ropeway

- Monocable Detachable Gondola (MDG) from Govindghat to Ghangaria (10.55 km) and Tricable Detachable Gondola (3S) from Ghangaria to Hemkund Sahib Ji (1.85 km).
- The project will be developed on Design, Build, Finance, Operate and Transfer (DBFOT) mode at a total capital cost of Rs. 2,730.13 crore.
- Will have capacity of 1,100 passengers per hour per direction, transporting up to 11,000 passengers daily.

Varanasi Urban Ropeway

- Passenger Ropeway from Varanasi Cantt station to Godowlia.
- The project will feature 148 Gondola cabins, capable of transporting up to 96,000 passengers per day.
- The cost of the project will be ~Rs. 645 crores.
- The ropeway system will be 3.75 km in length with five stations to facilitate ease of movement for the tourists, pilgrims and residents of Varanasi.

Ropeways and Cable Cars Infrastructure in India

Exceptional Operational Ropeway Projects in India:



Gulmarg Gondola Cable Car

- World's second-highest operating cable car at a height of ~4,200 meters
- Was a joint venture of the Jammu and Kashmir government and a French firm.



Darjeeling Ropeway

- India's oldest cable car system, started in 1968, connecting the town of Darjeeling to the banks of the Ramman River.
- The cable car system is a monocable continuous rotating gondola.



Joshimath–Auli Ropeway

- Connects Joshimath located at 6000 ft with the skiing destination of Auli at an altitude of 9000 feet.
- Longest cable car in India (~4 km)



Guwahati Passenger Ropeway

- India's first river ropeway
- Covers ~1.8 km distance from the banks of Guwahati city to North Guwahati bank.

Ropeways and Cable Cars Infrastructure in India: Opportunities and Challenges

Opportunities in Ropeway Infrastructure in India:



Tourism: India's hill stations & eco-tourism destinations offer strong potential for ropeways to improve accessibility.



Religious Connectivity: Ropeways can provide efficient & high-capacity access for pilgrims, reducing crowding.



Material Transportation: Ropeways can be used for transporting goods in remote or mountainous areas.



Mass Transit Systems: In densely populated cities facing severe congestion, ropeways can function as electric, space-efficient mass transit solutions.

Challenges in Building Ropeway Infrastructure in India:



Improper technical detailing on terrain & treatment : Lack of terrain specific technical studies and Non-binding nature of non- NHA contracts for conducting these studies compromises quality of the project.



High costs and Construction Challenges: Unstable geology, landslide-prone slopes, seismic risks, and difficult accessibility for heavy equipment.



Periodic Maintenance, Repair & Renewal: Ropeways require regular inspection of cables, towers, and safety mechanisms, raising lifecycle maintenance costs.



Disturbance to Ecosystems: Construction activities can disturb biodiversity & wildlife habitats increasing environmental scrutiny.

What needs to be done?

Encourage indigenous manufacturing of cabins, cables, drive systems, and safety technologies.

Encourage state governments and policy bodies to integrate ropeways into regional mobility master plans.

Promote urban ropeways in congested cities by integrating them with metro, bus, and railway networks.
E.g., Mi Teleférico in La Paz, Bolivia

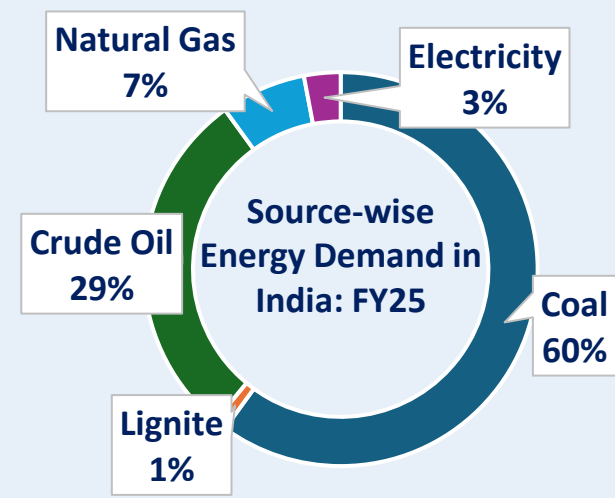
Develop sustainable financing models using tourism-linked revenues, and land value capture mechanisms around ropeway corridors.

A photograph of a cable car cabin suspended from a steel tower. The cabin is white with a black base and is positioned in the center of the frame. The tower is a complex lattice structure of steel beams. The background shows a cityscape at dusk or dawn, with a warm orange and yellow sky transitioning to a blue and purple hue. The city lights are visible in the distance.

21. Pipeline Infrastructure in India

Pipeline Infrastructure in India: Overview

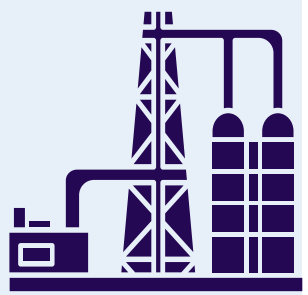
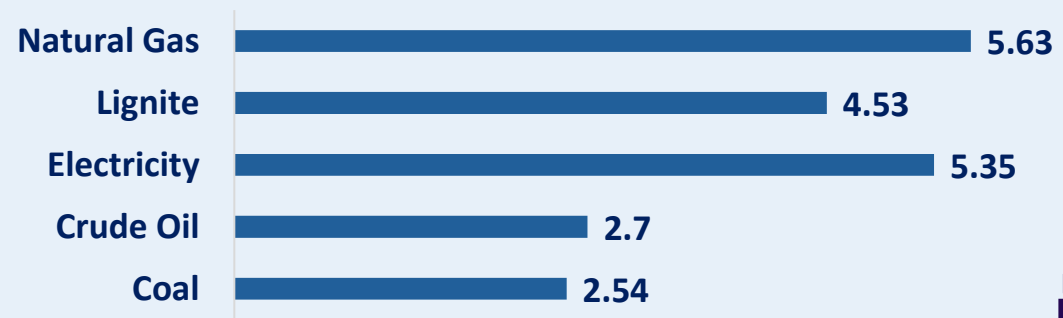
Oil and gas sector accounts for 36% of India's total energy demand



Pipelines serve as the primary and most efficient mode of transporting oil, natural gas, and petroleum products across vast distances worldwide. In the US, pipelines carry 70% of crude oil and products, compared to 97% in Canada.

Natural Gas witnesses the highest YoY demand growth in FY25

YoY Growth rate of consumption of Energy Resources in FY25



Categories of Pipelines:

- **Petroleum Pipeline:** Pipelines used to transport petroleum and crude oil products from the site of exploration to the end destination.
- **Natural Gas Pipeline:** Natural Gas pipelines are used for the transportation of gas and products from stationary facilities to end destinations like homes or export centers.

Pipeline Infrastructure in India: Overview



Oil pipeline infrastructure

13,652 km

- 9,301 km are operational
- 4,263.5 km under construction

City Gas Distribution (CGD) Network

PNG connections grew nearly 6x, from 0.254 crore (2014) to 1.47 crore (2025)

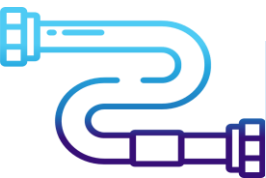
- 15.3 million domestic PNG connections
- 45,730 commercial PNG connections
- 20,697 industrial connections PNG connections

Pipeline Infrastructure in India: Notable Pipeline Projects under Implementation



- **Siliguri-Jhapa Pipeline Project & Greenfield terminal at Jhapa:** Laying of 8” Dia, 50 km, 1 MMTPA, transnational pipeline (36 km in India and 14 km in Nepal) from Siliguri to Jhapa (SJPL) & construction of a greenfield terminal at Jhapa (Nepal).
- **Amlekhgunj-Chitwan Pipeline Project & Greenfield terminal at Chitwan:** Laying of 10” Dia, 62 km, 2 MMTPA, pipeline from Amlekhgunj to Chitwan (SJPL) & construction of a greenfield terminal at Chitwan (Nepal).
- **New Mundra-Panipat Crude Oil Pipeline:** Laying a new 17.5 MMTPA crude oil pipeline from Mundra in Gulf of Kutch to Panipat in Haryana at a cost of around INR 9000 crore to meet the enhanced crude oil requirement of Panipat Refinery.
- **ATF pipeline from Jawaharlal Nehru Port Trust (JNPT) to Navi Mumbai International Airport (NMIA):** This Project involves laying an ATF pipeline from Jawaharlal Nehru Port Trust (JNPT) to the upcoming Navi Mumbai International Airport (NMIA) at a cost of INR 165 crore.
- **Hazaribagh-Ranchi Natural Gas Pipeline:** The project involves laying a Natural Gas pipeline from Hazaribagh to Ranchi in Jharkhand at a cost of around INR 200 crore.
- **Extension of Panipat-Jalandhar LPG Pipeline up to Goindwal Sahib Bottling plant:** Laying of an 85-km long LPG pipeline, from Jalandhar to Goindwal Sahib Bottling Plant in Punjab, as an extension of Panipat-Jalandhar LPG Pipeline.
- **MPPL (Panipat-Churwa section) from Crude Oil to Product:** Involves change of service of 22” dia 1120 Km long Panipat Churwa section of Old MPPL line from crude oil service to product service after commissioning of New MPPL to evacuate products ex. Panipat Refinery to Marketing terminals at Jaipur, Chittorgarh, Jodhpur, Sidhpur and Kandla.

Pipeline Infrastructure in India: Government Support



'One Nation, One Gas Grid':

Includes approving key trunk pipelines, providing viability gap funding in low demand areas, accelerating expansion of CGD network, setting up of Liquefied Natural Gas (LNG) Terminals, allowing marketing and pricing freedom with a ceiling price to gas produced from high pressure/high temperature areas, deep water & ultra-deep water and from coal seams.

One Nation, One Grid, One Tariff: Unified Pipeline Tariff regime:

Adoption of Unified Tariff Structure for natural gas transportation to encourage wider adoption of CNG and PNG.

Cross-Border Pipelines:

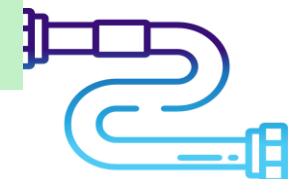
India is strengthening its pipeline infrastructure through cross-border projects like the India-Bangladesh Friendship Pipeline. The aim is to transport diesel efficiently, enhance regional connectivity, and support economic growth. Such initiatives boost energy security, deepen bilateral ties, and expand India's strategic pipeline network beyond its borders.

Expansion of City Gas Distribution (CGD):

PNGRB has authorized 307 Geographical Areas (GAs) covering almost 100% of total geographical area of the country spread over around 733 districts in 34 states/UTs for the development of CGD network.

Shift from Traditional Cooking Fuels to LPG:

Gol has administered various schemes such as subsidies related to sale of natural gas, Pradhan Mantri Urja Ganga Project, Pradhan Mantri Ujjwala Yojana (PMUY) to encourage households to shift from traditional cooking fuels to LPG.

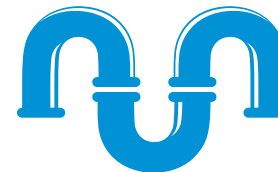


Pipeline Infrastructure in India: Advantages and Challenges



Advantages of Developing Pipeline Infrastructure in India

- **Energy security:** Ensures reliable and continuous supply of oil and gas across regions.
- **Regional development:** Expands energy access to remote and underdeveloped areas.
- **Minimal land usage:** Requires relatively less land compared to road and rail infrastructure, as pipelines are mostly underground.
- **Industrial growth:** Reliable fuel supply to power, fertilizer, and manufacturing sectors.
- **Cost efficiency:** Lower long-term transportation costs compared to road and rail, especially for bulk energy movement.



Challenges for Developing Pipeline Infrastructure in India

- **High initial capital cost:** Significant investment required for construction, technology, and land acquisition.
- **Geographical challenges:** Difficult terrain (mountains, forests, river crossings) increases complexity and cost.
- **Regulatory and approval delays:** Multiple clearances from central, state, and local authorities' slow execution.
- **Technical and engineering challenges:** The expansion of India's pipeline grid requires a sophisticated ecosystem of engineering, materials science, and manufacturing.
- **Operational challenges:** Leakages and spillages in distribution channels are another form of operational difficulty faced by the industry.

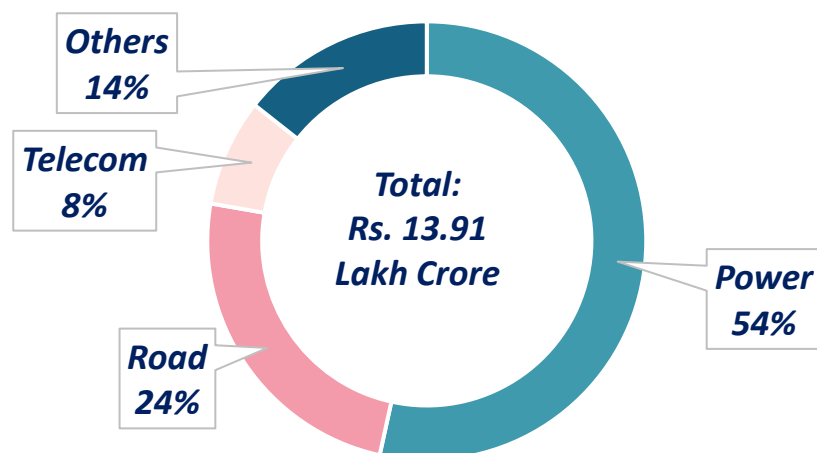
ECONOMIC SURVEY 2025-26



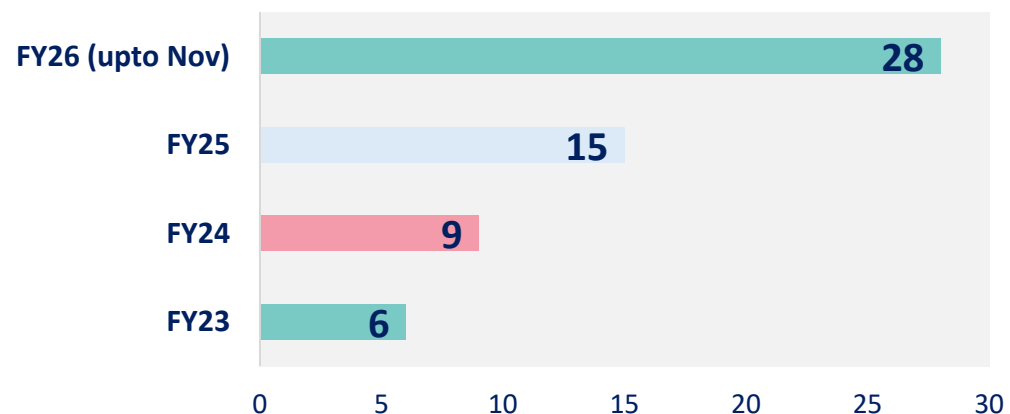
22. Infrastructure sector in Economic Survey FY26

Economic Survey FY26: Infrastructure in Focus:

Deployment of Gross Bank Credit to Infrastructure (Outstanding as on 31 October 2025)



Increase in project approvals by PPPAC



Milestones in Infrastructure Credit

Bank credit to infrastructure sector logged 4.6% growth (YoY) Oct'25, compared to 2.3% growth in Oct'24.

RBI (Project Finance) Directions 2025, effective from 01 October 2025: Introduction of a unified framework for project lending across all financial institutions, ensuring a consistent approach to large-scale financing.

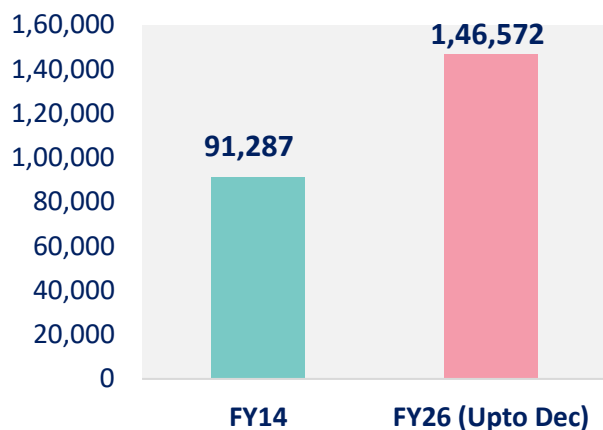
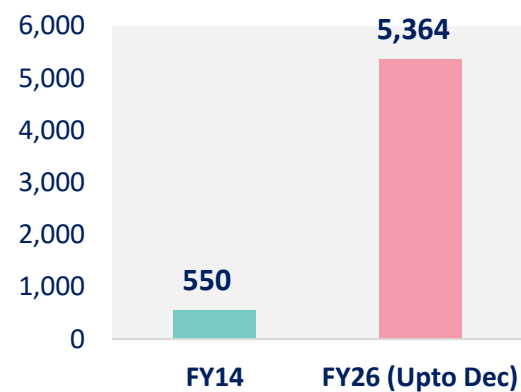
Expansion of Monetizable Assets: SEBI's Small and Medium Real Estate Investment Trusts (SM REIT) framework reduced the minimum asset size relative to existing REITs, from ₹500 crore to ₹50 crore to broaden the universe of monetizable real estate assets.

Sharp uptick in approvals granted by the Public-Private Partnership Appraisal Committee (PPPAC): Project approvals by the PPPAC rose to 28 in FY26 (up to Nov'25), from 15 in the previous year.

Economic Survey FY26: Infrastructure in Focus: Sectoral Insights

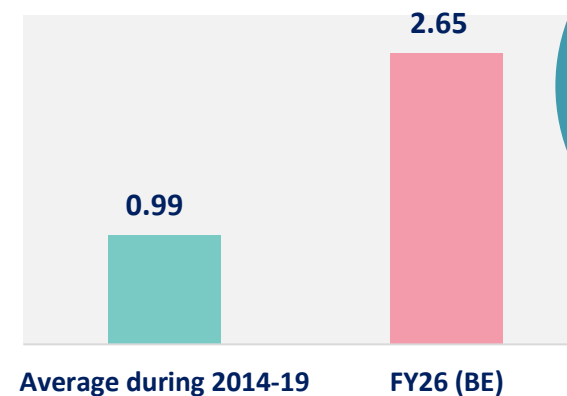
Roadways & Highways

Total NH Network (in Km)

Operational High-Speed
Corridors (in Km)

Total NH network in the country increased by 60% between FY14 and FY26, while operational high-speed corridors saw a 10 times increase. For FY26, 4,938 km of construction have been completed as of 31 December 2025. The momentum has been built by schemes like PMGSY-IV, PM GatiShakti and road connectivity vertical under PM-JANMAN.

Railways

Capital Expenditure on Railways
(in ₹ Lakh crore)

Rail Network:
69,439
Rkm

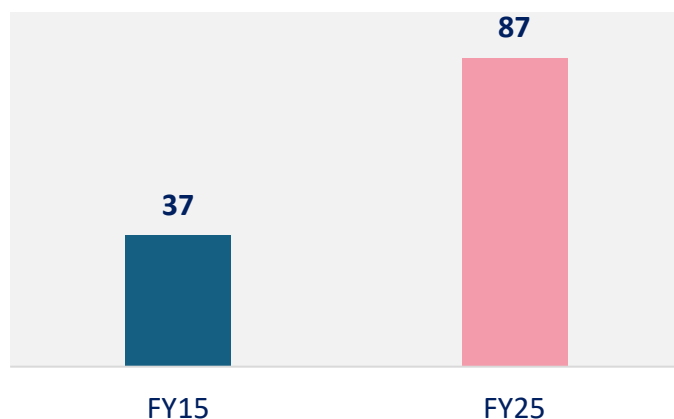
Target for
expansion in
FY26:
3,500 km

Capital expenditure on railways has recorded unprecedented growth in recent years with the government focusing on new lines, doubling and multi-tracking, rolling stock augmentation, signaling, and safety-related works. Also, parallel investments in stations, signaling, telecom and digital systems are enhancing network reliability, safety, and user experience.

Economic Survey FY26: Infrastructure in Focus: Sectoral Insights

Ports and Shipping

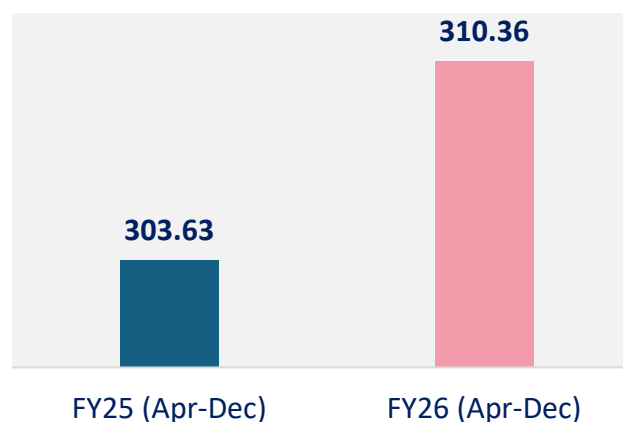
No. of PPP projects awarded for port development & operations



Significant strides have been made under the **Maritime India Vision 2030** and **Maritime Amrit Kaal Vision 2047** toward modernising port infrastructure, & expanding private sector participation. 2025 also saw a number of legislative reforms in the Ports and Shipping Sector, some of them being the Merchant Shipping Act, 2025; Indian Ports Act, 2025; Indian Ports Act, 2025.

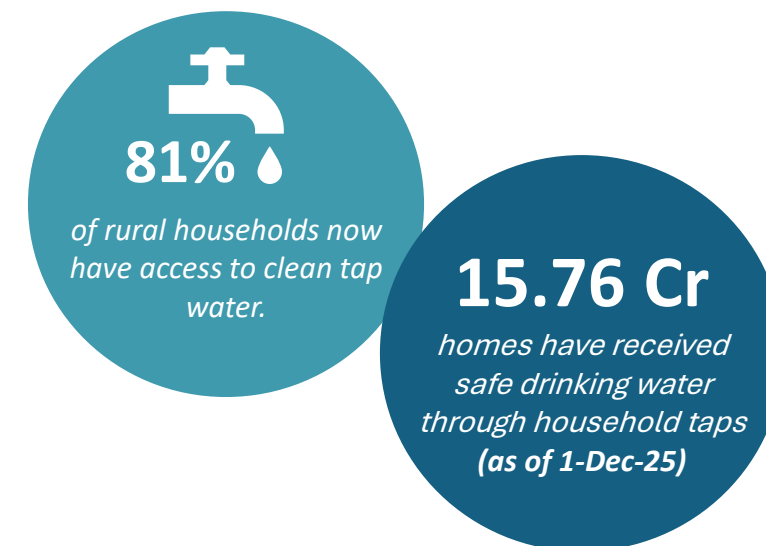
Civil Aviation

Passenger traffic at all airports (in Million)



India has emerged as the **world's 3rd largest domestic aviation market**, supported by a growing number of airports and rising volumes of passenger traffic as well as domestic and international air cargo in recent years. Passenger traffic in FY26 (Apr-Dec) was 2% higher than the same period last year.

Rural Drinking Water & Sanitation

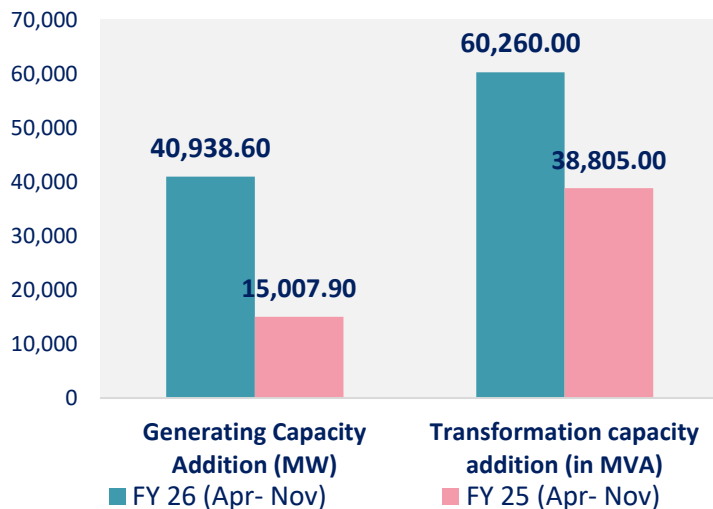


Substantial strides have been achieved in advancing universal water security in rural India under the Jal Jeevan Mission, now extended to 2028 with an increased allocation of ₹67,000 crore in the Union Budget 2025–26.

Economic Survey FY26: Infrastructure in Focus: Sectoral Insights

Power Sector

Capacity addition in the power sector



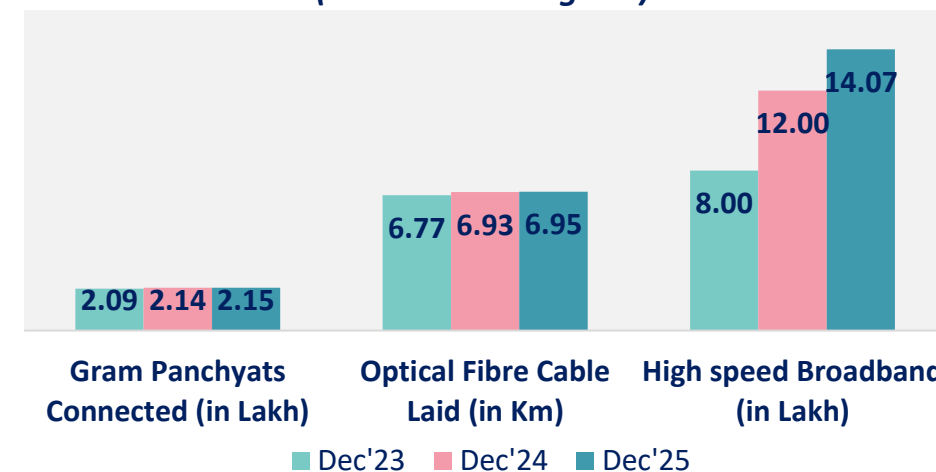
Rise in installed capacity by
11.6 %
(y/y) (Nov'25)

509.74
GW
(Nov'25)

India has achieved significant strides in the power sector as seen by the addition in generating capacity and transformation capacity in the first eight months of FY26. Growth in power infrastructure was driven by initiatives including DDUGJY, IPDS, and the Pradhan Mantri Sahaj Bijli Har Ghar Yojana (SAUBHAGYA).

Moving ahead, GoI has also proposed the **Electricity (Amendment) Bill, 2026** to enhance efficiency, competition & financial discipline in the power sector.

Digital Infrastructure

Progress in Telecommunication Infrastructure
(Bharat Net Progress)

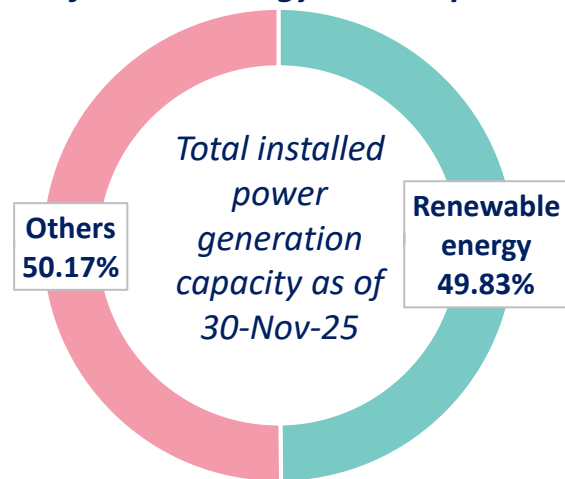
Telecom infrastructure has undergone a significant transformation, reflected in the expansion of connected gram panchayats and the growing length of optical fibre laid, driven by initiatives such as 5G deployment, 6G research, BharatNet, and the Digital Bharat Nidhi.

Data Centres: Industry estimates indicate that India has an installed data center capacity of ~ **1,280 MW** as of June'25: 130 private data centres & 49 government-operated facilities. Installed capacity in the sector is expected to reach **4 GW by 2030**.

Economic Survey FY26: Infrastructure in Focus: Sectoral Insights

Renewable Energy

Structural Transformation of India's Energy Landscape

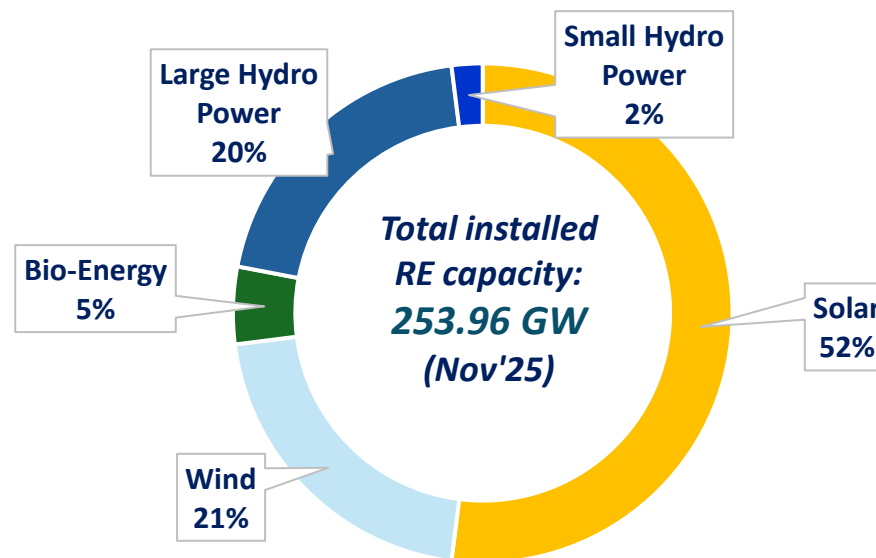


India Ranks:

3rd in overall Renewable Energy Capacity

3rd in installed solar capacity

4th in installed wind capacity



FY26 (up to Nov'25) witnessed largest ever annual increase in non-fossil capacity at

34.56 GW

Solar (27.20 GW)
Wind (3.95 GW)
Hydro (2.68 GW)
Bio-Power (0.03 GW)
Nuclear (0.70 GW)

Progress in renewable energy has been driven by:

1. Effective national renewable energy policies
2. Accelerated execution of large-scale projects
3. Strong private sector participation

Challenges to Address:

1. High capital costs
2. Land acquisition delays
3. Grid availability
4. Grid stability and peak-load management



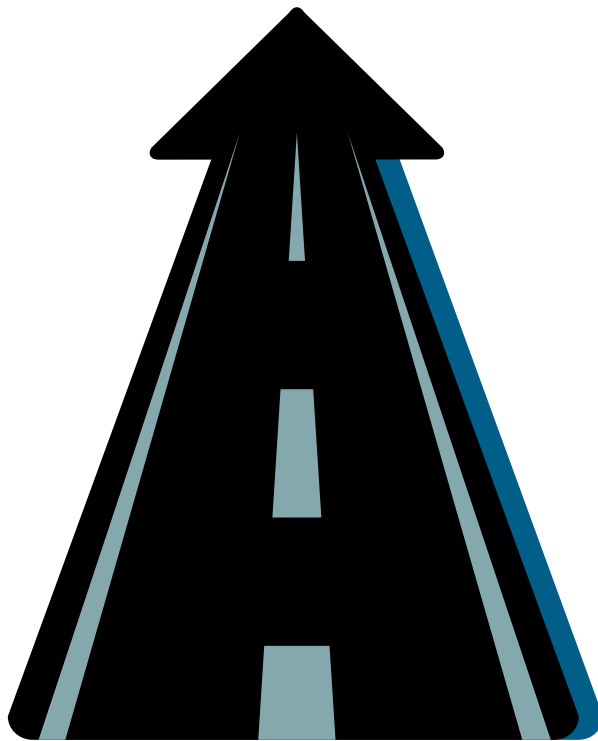
केन्द्रीय बजट
UNION BUDGET

23. Infrastructure sector in Union Budget FY27

Union Budget FY27: Infrastructure sector

'Delivering a powerful push to Infrastructure'

An intervention under the *kartavya* to
'Accelerate And Sustain Economic Growth'



Major Announcements:

- **Infrastructure Risk Guarantee Fund** to provide prudently calibrated partial credit guarantees to lenders.
- **Urban Infrastructure:**
 - Continued focus on developing Infrastructure development in cities with > five lakh population, (tier-2 and tier-3 cities).
 - Mapping of City Economic Regions (CER) with Rs.5,000 crore per City Economic Regions (CER) over 5 years to boost Tier-2, Tier-3 cities and temple towns.
- **Scheme for Enhancement of Construction and Infrastructure Equipment (CIE)** to be introduced to strengthen domestic manufacturing of high-value and technologically-advanced CIE.
- **High-Speed Rail corridors between cities as 'growth connectors'**, namely i) Mumbai-Pune, ii) Pune-Hyderabad, iii) Hyderabad-Bengaluru, iv) Hyderabad-Chennai, v) Chennai-Bengaluru, vi) Delhi-Varanasi, vii) Varanasi-Siliguri.
- Development of sport infra for training and competition under *Khelo India Mission*
- **Data Centres:** Tax holiday till 2047 to any foreign company that provides cloud services to customers globally by using data centre services from India.
- Establishment of **new Dedicated Freight Corridors** connecting Dankuni in the East, to Surat in the West and operationalising 20 new National Waterways connecting mineral rich areas, industrial centres and ports.

Implications:

These announcements, taken together, create a **strong multiplier effect for infrastructure growth** by reducing financing risks, boosting private investment and strengthening urban infrastructure in smaller cities.



Thank You

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