

NITI Aayog unveils a report on India's Advanced Manufacturing Roadmap to Global Leadership

The report identifies thirteen high-impact sectors, grouped into five core clusters, and prioritizes four disruptive frontier technologies for scaled adoption: **Artificial Intelligence/Machine Learning (AI/ML)**, **Advanced Materials**, **Digital Twins**, and **Robotics**.

Imperatives for transformation of India's manufacturing sector

- **Current status:** Historically, India's **manufacturing sector has contributed 15-17% to its GDP**, significantly lower than peer East Asian economies during their peak development.
- **Structural challenges:** Limited investment in R&D limiting '**Creative Destruction**'; fragmented value chains inhibiting consistency, scale, and integration; regulatory complexity and policy uncertainty; among others.
- **Opportunity Cost:** Failing to adopt frontier technologies in high-impact sectors would result in a potential loss of **US \$270 billion** in additional manufacturing GDP by 2035.

Four Pillars of Transformation: Frontier Technology Pathways

Frontier Technology	Potential Applications
 AI/ML	• Hyperlocal Demand Intelligence: Ingest vernacular content and regional trends to create real-time demand maps, enabling micro-factory networks, Tier-2/3 suppliers to respond dynamically. • Autonomous Batch Release: Regulatory-aware AI agents in pharmaceuticals and chemicals can track real-time compliance to accelerate batch release and enhance global trust.
 Advanced Material Science	• Lightweight Multi-Functional Composites: Using thermoplastic composites in railways and defence to combine structural integrity with embedded functions like shielding and damping. • Green Catalysts: Adopting nano-engineered catalysts in chemical manufacturing for low-emission synthesis, improving strategic supply chain resilience.
 Digital Twins (virtual, data-driven replicas of physical systems)	• Accelerating Aerospace & Defence R&D: Virtually designing, simulating, and validating aircraft components under real-world conditions to reduce development time and physical testing costs. • Predictive Maintenance: Creating real-time replicas of construction and mining machinery to detect early failure signs, extending asset life.
 Robotics	• Telerobotics: Enabling remote control of robots for tasks in hazardous environments (e.g., chemical plants, nuclear facilities), supported by 5G and haptic feedback. • Exoskeletons: Augmenting human workers with wearable devices to reduce physical strain and injury risk in strenuous or repetitive tasks.

Integrated Cold Chain and Value Addition Infrastructure (ICCVAI) Scheme

The ICCVAI Scheme, a demand driven scheme run by the **Ministry of Food Processing Industries (MoFPI)** as part of **Pradhan Mantri Kisan Sampada Yojana (PMKSY)**, addresses significant post-harvest losses in perishable commodities in India.

Key Objectives

- Build **seamless cold chain** from farm to consumer
- **Reduce post-harvest losses** through scientific preservation and efficient storage systems
- **Value addition** by increasing shelf life by promoting processing\
- **Ensure steady food availability** of safe, high-quality food products for consumers.

Key Components

- **Farm-Level Infrastructure** (Pre-cooling units), **Processing Centres**, **Distribution Hubs** (Centralized storage, consolidation, and dispatch centres for efficient movement of produce) & **Refrigerated Transportation**.

Who are eligible for establishment of food processing units?

- Individuals (including farmers).
- Organizations:Farmer Producer Organizations (FPOs), Farmer Producer Companies (FPCs), NGOs, PSUs, Firms, Companies, Corporations, Cooperatives, and Self-Help Groups (SHGs).

Key Government Initiatives Complementing the ICCVAI Scheme

- **Mission for Integrated Development of Horticulture (MIDH):** Provides financial assistance for cold storages up to 5,000 MT capacity.
- **National Horticulture Board (NHB):** Supports construction/modernization of cold storage facilities ranging from 5,000 MT to 20,000 MT.
- **Agriculture Infrastructure Fund (AIF):** Facilitates term loans up to ₹2 crore with a 3% per annum interest subvention.
- **Operation Greens Scheme:** Covers fruits, vegetables, and shrimp for price stabilization and post-harvest loss minimization.

Workforce Challenges in India's Primary Healthcare System

Recurrent strikes by **National Health Mission (NHM)** staff and state-level protests by **ASHA** and **Anganwadi workers** have revealed deep-rooted structural weaknesses in the primary healthcare system of India.

Key Cadres Supporting Primary Healthcare

Cadre	Origin	Primary Role	Pay structure
Anganwadi Workers (AWWs)	Integrated Child Development Services (ICDS, 1975)	Nutrition, maternal & child health	Honorarium
ASHA Workers	National Rural Health Mission (NRHM, 2005)	Mobilisation, awareness, link between community & system	Incentive-based
Community Health Officers (CHOs)	Health and Wellness Centres; 2018	Provide expanded primary care services	Contractual + incentives

Key Challenges

- **Expanding Responsibilities:** Added duties like **population enumeration**, **Non-Communicable Disease** and **palliative care**, without matching pay or support.
- **Poor Remuneration & Protection:** Low, **irregular payments**; **no social security**; limited safety during fieldwork (still recognised as volunteers).
- **Unionisation and Strikes:** Growing **union presence reflects discontent**, Kerala and Haryana ASHAs, and Anganwadi unions nationwide, are demanding regularisation and fair pay.
- **Vacant Regular Posts:** ~10–15% **Auxiliary Nurse Midwife** posts and 20–25% **doctor posts** remain vacant.
- **Contractualisation trend:** Rising contractual **hiring reflects cost-cutting and ease of administration** but lacks clear **career growth or cadre structure**.

Conclusion

A balanced workforce model, coupled with transparent recruitment, fair incentives, and continuous capacity building, is essential to strengthen India's health system.

China files complaint in WTO over subsidies under PLI scheme

China **alleged** that 3 Indian PLI schemes related to EV and battery provide **financial benefits** to companies operating in India contingent on Domestic Value Addition (DVA).

➤ The 3 specific PLI schemes challenged are:

- ⊕ Scheme to incentivise establishment of **Giga-scale manufacturing capabilities of ACC batteries**;
- ⊕ Scheme for auto industry, which seeks to buttress the **manufacturing of Advanced Automotive Technology (AAT)** products;
- ⊕ Scheme to promote **EV manufacturing** by attracting global EV manufacturers.

➤ DVA requirements under these PLI schemes incentivise companies to use domestic goods rather than imported goods are a violation of Agreement on Subsidies and Countervailing Measures ("SCM Agreement") of WTO under **prohibited category**.

About SCM Agreement of WTO

➤ **Article 1** defines a subsidy as a financial contribution by a government or a public body that confers a benefit.

➤ The SCM Agreement creates 2 categories of subsidies: **Prohibited and Actionable**.

⊕ **Prohibited:** 2 categories of subsidies are prohibited by Article 3.

- ◆ **First:** It consists of subsidies contingent, in law or in fact, whether wholly or as one of several conditions, on export performance ("**export subsidies**").
- ◆ **Second:** It consists of subsidies contingent, whether solely or as one of several other conditions, upon the **use of domestic over imported goods ("local content subsidies")**.

⊕ **Actionable:** They are subject to challenge, either through multilateral dispute settlement or through countervailing action.

About PLI Scheme

- **Origin:** Launched in 2020 to boost domestic manufacturing through targeted, performance-based incentives across strategic sectors.
- **Key sectors covered:** Initially targeted 3 sectors and over time expanded to include **14 sectors** ranging from electronics and textiles to automobiles and food processing.

India's total installed electricity capacity crosses 500 GW

India has also achieved one of its major **COP26 (Panchamirit goals)** to have **50 % of installed electric power capacity from non-fossil fuel sources** by 2030 five years ahead of the schedule.

➤ India's Present Energy Mix:

- ⊕ Non-fossil fuels-51% (256 GW),
- ⊕ Fossil fuels 49% (244 GW).

➤ **Share of Renewables:** Solar: 127 GW, Wind: 53 GW, Hydro: 47 GW.

India's Key Renewable Energy Initiatives

- **PLI Scheme:** to boost domestic manufacturing of high-efficiency **Solar PV modules**.
- **PM-KUSUM:** to install **grid-connected** solar power plants and **solarise** agricultural pumps.
- **Green Hydrogen Mission:** Aimed at making India a **global hub** for the production, utilisation, and export of Green Hydrogen.
- **Green Energy Corridor:** to strengthen the transmission network for evacuation of **large-scale** renewable power.
- **RPO Obligation:** Mandates discoms to procure a **specified minimum percentage** of power from renewable sources.

Key Issues in Renewable Energy Expansion

- **Grid & Storage Constraints:** RE sources are **variable and unpredictable** as they are dependent on fluctuating weather conditions.
- **Transmission Bottlenecks:** Solar plants can be built within a year, but transmission lines take up to two-and-a-half years.
- **Financing Risks:** Unsigned Power Purchase Agreements and financially weak discoms hinders project uptake.
- **High Import Dependence:** Reliance on foreign solar modules and critical minerals.
- **Land & Policy Delays:** Land acquisition hurdles and inconsistent state regulations slow project execution.

Way Forward

- **Storage Investment:** Mandate large-scale **Battery Energy Storage Systems (BESS)**.
- **Stronger Infrastructure:** Fast-track the Green Energy Corridor and streamline land approvals.
- **Domestic Manufacturing:** Expand local production of solar modules, batteries, and green hydrogen technologies.
- **Policy Stability:** Ensure predictable regulations and promote decentralised renewable energy, especially rooftop solar.



Also In News



National Crises Management Committee

The Cabinet Secretary chaired a meeting of the **National Crisis Management Committee (NCMC)** in regard to cyclones in Bay of Bengal.

About NCMC

- **Has been given statutory status under** The Disaster Management Act (Amendment) Act, 2025.
- **Status:** Nodal **statutory body to deal with the major disasters** which have serious or national ramifications.
- **Members:** Cabinet Secretary as **Chairperson and such other members as may be notified by the Central Government**.
- **Powers and Functions:**
 - ⊕ Can evaluate **preparedness for any disaster or emergency situation**.
 - ⊕ **Coordinates and monitors national disaster response efforts**.



Quantum information Scrambling

Google achieved a **verifiable quantum advantage**, proving its quantum processor "**Willow**" outperforms the fastest supercomputers.

- The team detected faint "**echoes**" of **scrambled data**, proving information retention through entanglement.

About Quantum information Scrambling

- **Definition:** It refers to the rapid spread of information across a quantum system, making it inaccessible to local measurements.
- **Mechanism:** It distributes quantum data among particles through entanglement, hiding information globally rather than erasing it.
 - ⊕ **Analogy:** Like a **drop of dye dispersing in water**, information initially stored in one qubit gets distributed among many qubits.
- **Significance:** Demonstrates a **verifiable quantum advantage** and enhances understanding of **quantum technologies**.



UNEP'S Adaptation Gap Report 2025

Key Findings

- **Finance Gap:** Developing nations face an **adaptation shortfall of \$310–365 billion/year** by the mid-2030s.
 - ⌚ **Current Funding:** Global adaptation finance is only **\$26 billion**, far below needs.
- **Implementation Lag:** Most nations have plans, but **execution and quality** remain weak.
- **Urgent Action:** Calls for a **major scale-up** in finance, innovative tools, and stronger resilience planning.
- **India's Scenario:** India has advanced its **National Adaptation Fund** and **State Action Plans**, but **remains highly vulnerable** to heat stress, erratic monsoons, and coastal flooding.



Large Magellanic Cloud

Researchers identified 5 carbon-rich compounds surrounding a nascent star called ST6 in the Large Magellanic Cloud (LMC).

- The discovery could illuminate how life's building blocks formed in the universe's infancy.

About Large Magellanic Cloud (LMC)

- It is a **satellite galaxy** of the Milky Way, floats in space nearly 200,000 light-years from Earth.
- This dwarf **galaxy looms large** on the southern nighttime sky at **20 times** the apparent diameter of the full Moon.
- **Vast clouds of gas** within it slowly collapse to form **new stars**.



World Inequality Report 2025

Climate Inequality Report 2025 is was recently released by **World Inequality Lab**.

Key Findings

- **Disproportionate Emissions from Wealth Ownership:** **Top 1% contributes 15%** of global consumption-based emissions but **41% of emissions arising from private capital ownership**.
- **Extreme Emission Inequality:** Per capita emissions of the top 1% are **75 times higher** than those of the bottom 50% by consumption.
- **Concentration of Industrial Emissions:** Around 100 companies are responsible for **71% of industrial GHG emissions**.



Doctrine of Merger

The Supreme Court(SC) has recently clarified the 'Doctrine of Merger' not of rigid & universal application.

Doctrine of Merger

- **Rationale:** there cannot be more than one operative decree at a given point of time.
- **Application:** It applies irrespective of whether the appellate court has affirmed, modified or reversed the decree of the trial court.
 - ⌚ It means that after a **higher court gives its verdict, the lower court's decision becomes part of that ruling** and is no longer treated as a standalone judgment.
- **Purpose and Benefits:** maintenance of the decorum of the hierarchy of courts and tribunals, **ensures finality in judicial decisions**.
- **In State of Madras v. Madurai Mills Co. Ltd.,** SC held that the doctrine of merger applies **depending on the nature of the appellate or revisional order and the scope of the statutory provisions granting such jurisdiction**.



Legal Metrology (Packaged Commodities) Amendment Rules, 2025

Department of Consumer Affairs, Ministry of Consumer Affairs, Food and Public Distribution, has notified the **Legal Metrology (Packaged Commodities) Amendment Rules, 2025**.

About the Amendment Rules 2025

- Introduces **specific provisions for packages containing medical devices**, aligning the Legal Metrology (Packaged Commodities) Rules, 2011 with the **Medical Devices Rules, 2017**.
- It provides that while requirement to make mandatory declarations remains, the specific font size and dimensional standards prescribed under Medical Devices Rules shall apply instead of those under Legal Metrology (Packaged Commodities) Rules.
- It aims to ensure **regulatory harmony, reduce compliance ambiguity, and enhance consumer protection** in the healthcare sector.



Place in News



Tajikistan (Capital: Dushanbe)

India withdrew from the **Ayni airbase** in Tajikistan after the expiration of the bilateral agreement.

Political Features

- **Location:** Landlocked country in Central Asia
- **Borders:** Afghanistan (South), China (East), Kyrgyzstan (North), and Uzbekistan (West).
- **Importance:** Member of SCO and CSTO.
- **Strategic Relevance:** Lies near **Wakhan Corridor**, linking Central and South Asia.

Geographical Features

- **Climate:** mid-latitude continental, hot summers, mild winters; semiarid to polar in Pamir Mountains
- **Highest Point:** Ismoil Somoni Peak (7,495 m).
- Karakul and Iskanderkul are key alpine lakes.



AHMEDABAD



BENGALURU



BHOPAL



CHANDIGARH



DELHI



GUWAHATI



HYDERABAD



JAIPUR



JODHPUR



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