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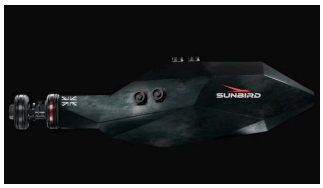
National and International News

Sunbird 	Why It's in the News: • **Sunbird Rocket:** A nuclear fusion-powered rocket developed by UK startup Pulsar Fusion. • **Potential to Reduce Travel Time:** The rocket could help spacecraft reach Pluto in 4 years and cut the time to Mars by half. **Key Points:** • **Fusion Technology:** Sunbird uses a nuclear fusion engine to achieve speeds up to 805,000 km/h, faster than the Parker Solar Probe. • **Orbital Test in 2027:** Pulsar Fusion plans to demonstrate Sunbird in orbit by 2027. • **Interplanetary Travel**: Sunbird will assist larger spacecraft in covering vast distances, providing propulsion support. • **Challenges:** Technical hurdles include miniaturizing and making fusion-powered rockets more lightweight. • **Market Potential:** Sunbird could be used for satellite shuttling and delivering heavy payloads to Mars within six months.
National Critical Mineral Mission (NCMM)	**Why in news?** • To meet its clean energy targets and reduce import dependency, India launched the National Critical Mineral Mission (NCMM) in 2025. • The initiative seeks to secure supplies of crucial minerals needed for green technologies like solar energy, EVs, and battery storage systems. **Key points:** • India's green energy ambitions hinge significantly on the availability of critical minerals, indispensable to technologies like solar panels, wind turbines, electric vehicles (EVs), and battery storage. • To secure these vital resources, the Government of India launched the National Critical Mineral Mission (NCMM) in 2025. • Spearheaded by the Geological Survey of India (GSI) and coordinated by the Ministry of Mines, the mission aims to reduce import dependency, strengthen domestic capabilities, and enhance global competitiveness through focused exploration, processing, and recycling of critical minerals. **Key Highlights of the National Critical Mineral Mission (NCMM)** **Mission Objectives** • Ensure long-term availability of critical minerals. • Enable domestic exploration and reduce import reliance.

	• Build strategic foreign partnerships for overseas asset acquisition. • Develop value chains for mining, processing, and recycling. • Promote innovation, R&D, and skill development. **List of Identified Critical Minerals:** • In 2022, a committee identified 30 critical minerals. • 24 minerals were included under Part D of Schedule I of the MMDR Act, 1957, giving exclusive auction rights to the central government. • These include lithium, cobalt, rare earth elements (REEs), nickel, tungsten, tellurium, silicon, and more.
Periodic Labour Force Survey (PLFS)	**Why in news?** • The latest figures from the Periodic Labour Force Survey (PLFS) for 2024 indicate a slight improvement in India's employment landscape, with the unemployment rate among individuals aged 15 and above falling from **5.0% to 4.9%.** **Key Highlights from PLFS 2024:** **Unemployment Trends (15 years and above)** • All-India unemployment rate: Slight dip from 5.0% (2023) to 4.9% (2024). **Rural unemployment:** • Decreased from 4.3% to 4.2%. • Both male and female unemployment saw marginal reductions. **Urban unemployment:** • Male unemployment increased from 6.0% to 6.1%. • Female unemployment decreased from 8.9% to 8.2%. • Overall urban unemployment rate remained stable at 6.7%. **Labour Force Participation Rate (LFPR):** • LFPR (15+ years, PS+SS) at national level slightly declined from 59.8% to 59.6%. **Urban areas** • Male LFPR increased from 74.3% to 75.6%. • Female LFPR increased marginally from 25.5% to 25.8%. • Overall urban LFPR rose from 50.3% to 51.0%. • Overall LFPR remained constant at 56.2%, with minor category-wise variations. **Worker Population Ratio (WPR):** • All-India WPR saw a marginal decline from 58.0% to 57.7%. • Urban WPR improved slightly from 47.0% to 47.6%. • Drop in rural female WPR possibly linked to decline in unpaid female helpers in household enterprises: ○ Share of female helpers decreased from 19.9% to 18.1%.

Blue washing	**Context:** • The Central Pollution Control Board (CPCB) has introduced a new **'blue category' for industries, based on Essential Environmental Services (EES).** • This includes composting, biogas, material recovery, and sewage treatment, but controversially includes Waste-to-Energy (WTE) incineration. **Key points:** • **WTE Incineration:** Involves burning waste to generate electricity but releases toxic pollutants like carcinogens, NOx, SOx, and dioxins. • **Environmental Harm:** WTE plants worsen air quality, emit carcinogens, and create hazardous ash and effluents. • **Reclassification Concerns:** WTE plants were moved from 'red category' to 'blue category', allowing them two more years to operate—criticized as "bluewashing." • **Flawed Methodology:** WTE incineration contradicts CPCB's own criteria for 'blue category' industries, which should promote a circular economy. • **Negative Impacts:** WTE incinerators lead to job losses, harm local communities, and create financial burdens on urban bodies. • **Carcinogen Emissions:** CPCB inspections revealed WTE plants emitting carcinogens above permissible levels, worsening air quality. • **Circular Economy Violation:** WTE incineration contradicts circular economy principles, as it involves waste disposal rather than recycling or reusing materials. • **Bluewashing:** The reclassification of WTE incineration is seen as a way for the industry to gain legitimacy despite harmful environmental effects.
BM-04 Missile	**Context:** • The BM-04 is a next-generation short-range ballistic missile (SRBM) unveiled by DRDO in April 2025. • It is designed for conventional strike roles, similar to the Agni-P missile, with a range of 1,500 km and a 500 kg conventional warhead. • The missile has enhanced speed, maneuverability, and precision, with a 30-meter circular error probability (CEP). **Key Features**: • Length: 10.2 meters, Diameter: 1.2 meters, Weight: 11,500 kg. • Two-stage solid-fuel propulsion system. • Can be deployed using a six-wheel indigenous transport erector launcher (TEL).

- Canisterized, allowing quick deployment and readiness.

Potential for Upgrades:

- The missile can be regularly upgraded with new warheads, sensors, and propulsion systems.
- It is expected to incorporate artificial intelligence (AI) and hypersonic capabilities, ensuring its adaptability to evolving threats.

Strategic Purpose:

- Designed as a conventional counterforce weapon, the BM-04 targets critical infrastructure such as air bases, command centers, and missile systems.
- The missile supports India's doctrine of conducting precision strikes under a nuclear umbrella at conventional and subconventional levels.

Comparison to Existing Systems:

- The BM-04 has a longer range (1,500 km) compared to the Pralay missile (500 km), providing India with more flexibility in strategic positioning and reducing vulnerability to Pakistani counterattacks.
- It can strike from a safer distance, making it harder for adversary platforms to target launch sites.

Implications for India-Pakistan Relations:

- The BM-04 enhances India’s conventional missile force and its ability to neutralize Pakistani conventional counterforce targets.
- It also supports India’s pre-emptive strike posture, furthering the capability to conduct rapid precision strikes.

Military Doctrinal Shift:

- The development confirms India's military doctrine focused on limited operations at conventional and subconventional levels, under the protection of nuclear deterrence.
- While the missile does not directly threaten regional stability, it contributes to a shift in India’s military posture, increasing reliance on ballistic missiles for future conflicts.

Strategic Disparity:

- The BM-04 missile exacerbates the growing military disparity between India and Pakistan, signaling India’s attempt to diversify its missile force and bolster its conventional strike

	capabilities. **Risk of Escalation**: • The missile's development implies a higher likelihood of India initiating limited violence at the conventional or subconventional level, heightening regional tensions.