

7. Short News

1. Maharashtra's First Net Zero Village - Bela Gram

During Mumbai Climate Week 2026, Bela Gram in Maharashtra was highlighted as the State's first net-zero village driven by panchayat-led climate action. Bela Gram also won the 2024 Rashtriya Panchayat Puraskar.

About Net Zero Village

A net-zero village balances greenhouse gas emissions with equivalent reductions or offsets through renewable energy, afforestation, sustainable livelihoods, and community-driven climate governance.

Factors Making Bela Gram a Net-Zero Village

Community-Led Afforestation - The Gram Panchayat planted over 90,000 trees during weddings and festivals, enhancing carbon sequestration and community participation.

Clean Energy Transition - Households shifted from traditional smoky chulhas to LPG, reducing indoor air pollution and carbon emissions.

Solar Energy Adoption - Solar panels were installed in homes, anganwadis, and Panchayat offices, promoting decentralised renewable energy generation.

Waste Management Reforms - Doorstep waste segregation and elimination of single-use plastics strengthened sustainable waste practices.

Water and Livelihood Sustainability - Climate-resilient measures supported ecological balance, biodiversity conservation, and long-term rural livelihoods.

Significance

Model of Grassroots Climate Governance - Bela Gram demonstrates that Panchayati Raj Institutions can lead decentralised and participatory climate action.

Replicable Rural Sustainability Framework - The village provides a scalable template for integrating renewable energy, afforestation, and waste management at the local level.

Contribution to National Climate Goals - Bela Gram's achievement supports India's commitment to achieve net-zero carbon emissions by 2070, announced at COP26 under the five-point Panchamrit strategy, by translating national climate pledges into measurable grassroots action.

Mumbai Climate Week (MCW)

MCW is first-of-its-kind, citizen-led climate action initiative in India, designed to accelerate climate solutions specifically for the Global South. The inaugural edition was held from February 17-19, 2026, at the Jio World Convention Centre in Mumbai.

2. Zinc-Ion Batteries

Indian researchers have created a new cathode material that could make zinc-based batteries a viable option for storing renewable energy on a large scale.

What is Zinc-Ion Batteries?

1. Zinc-Ion Batteries are rechargeable batteries that use zinc metal (Zn) as the anode and Zn^{2+} ions as charge carriers.
2. They usually employ an aqueous (water-based) electrolyte, making them safer than lithium-ion batteries.

3. During discharge, zinc oxidizes ($\text{Zn} \rightarrow \text{Zn}^{2+} + 2\text{e}^-$) and releases electrons; during charging, zinc ions deposit back onto the anode.

Key Components

Anode – Metallic zinc

Cathode – Materials like manganese dioxide (MnO_2), vanadium oxides, or Prussian blue analogues

Electrolyte – Aqueous zinc salt solution (e.g., ZnSO_4)

Major Advantages

Exceptional Safety – Non-flammable aqueous electrolytes eliminate fire/explosion risks (unlike lithium-ion's organic electrolytes).

Very Low Cost – Zinc is abundant, cheap, non-toxic, and widely recycled.

Eco-Friendly – Low environmental impact, no rare/critical metals (e.g., no cobalt/lithium dependency), and easier recycling.

High Ionic Conductivity – Aqueous electrolytes enable fast ion transport and ambient manufacturing.

Best Suited For – Stationary/grid-scale storage, solar/wind integration, and applications prioritizing safety and cost over ultra-high energy density.

Challenges

Zinc Anode Issues – Dendrite growth (risk of short circuits), corrosion, passivation which causes reduced efficiency and cycle life

Cathode Limitations – Structural instability, dissolution (e.g., in MnO_2 or V-based materials), poor Zn^{2+} diffusion/kinetics causing capacity issues.

Overall Performance – Lower energy density compared to lithium-ion batteries

New Cathode Material for Zinc-Ion Batteries

Discovery By – at the Centre for Nano and Soft Matter Sciences (CeNS) in Bengaluru, an autonomous institute under India's Department of Science and Technology.

Cathode Material – A material called "sulfur vacancy-induced 1T-phase Molybdenum Disulfide (1T- MoS_2)".

Key features – This metallic 1T-phase material includes intentional sulfur deficiencies (vacancies).

Synthesis method – A controlled hydrothermal process produces nanoflakes with high surface area and improved electrical conductivity.

Efficiency – The fabricated zinc-ion battery retained 97.91% of its initial capacity after 500 continuous charge-discharge cycles. The device also exhibited a Coulombic efficiency of 99.7%, indicating highly reversible zinc-ion insertion.

Benefits – These properties enable faster electrochemical reactions, better zinc-ion diffusion, and higher charge storage capacity.

3. El-Fasher, Sudan

The UN's independent fact-finding mission on Sudan said that the siege and capture of El-Fasher by a paramilitary group bore "the hallmarks of genocide".

About El-Fasher

Location – El Fasher is a major city in western Sudan, serving as the capital of North Darfur state in the Darfur region.

Civil War – El Fasher has been at the centre of Sudan's ongoing civil war (since April 2023) between the Sudanese Armed Forces (SAF) and the paramilitary Rapid Support Forces (RSF).

Genocide - In 2024-25 the RSF imposed an 18-month siege on the city, trapping an estimated 260,000 civilians. The siege involved blocking food, water, medical supplies, and humanitarian aid, leading to starvation, disease outbreaks, famine conditions, and widespread suffering. According to the recent report by the UN the genocide particularly targeted non-Arab ethnic groups like the Zaghawa and Fur communities.

Strategic Importance - The city's location gives the RSF full access to vital supply lines.

4. Vibrant Village Programme Phase-II

Recently, the Union Government expanded the Vibrant Village Programme Phase-II to cover 1,954 villages along India's western and eastern international borders.

About Vibrant Village Programme Phase-II (VVP-II)

VVP-II is a Central Sector Scheme aimed at comprehensive development of strategic villages along international land borders, excluding those covered under the northern border phase.

Targeted Villages - The scheme covers 1,954 villages across 15 States and 2 Union Territories bordering Pakistan, Nepal, Bangladesh, Bhutan, and Myanmar.

Financial Outlay and Duration - Approved in 2025 with an outlay of ₹6,839 crore, the programme will be implemented till financial year 2028-29, with ₹3 crore proposed per village.

Objectives - The scheme seeks to strengthen infrastructure, saturate welfare schemes, enhance livelihoods, promote national integration, and reduce vulnerability to trans-border crimes and migration.

About Vibrant Village Programme (VVP-I)

VVP-I was launched in 2023 as a Centrally Sponsored Scheme for villages along the northern border adjoining China.

Implementing Ministry - Ministry of Home Affairs (MHA).

Allocation - ₹4,800 crore (including ₹2,500 crore for roads).

Duration - FY 2022-23 to 2025-26.

Targeted Villages - The first phase focused on select villages in blocks along the Line of Actual Control (LAC). It was implemented in 662 border villages across 46 blocks in Arunachal Pradesh, Himachal Pradesh, Sikkim, Uttarakhand, and Ladakh.

Core Objectives - The programme aims to provide all-weather road connectivity, telecom and television access, electrification through convergence of schemes, and improved socio-economic conditions.

Significance

Strengthening Border Security - Development reduces migration and discourages illicit cross-border activities by integrating residents as partners in border management.

Promoting Inclusive Growth - The programme ensures that remote border regions participate in national development and benefit from infrastructure and livelihood opportunities.

Enhancing National Integration - By fostering trust between border communities and security forces, VVP reinforces social cohesion and internal security.

5. Diego Garcia

Recently, US President Donald Trump warned the U.K. against leasing Diego Garcia to Mauritius, citing its strategic importance amid potential U.S. military action against Iran. The 2019 advisory opinion of the International Court of Justice termed its separation from Mauritius unlawful and a 2025 UK-Mauritius treaty proposes sovereignty transfer with base retention under lease.

About Diego Garcia

Diego Garcia is a coral atoll in the central Indian Ocean, about 1,800 km south of India, forming the largest island of the Chagos Archipelago.

Landform & Ecology – A horseshoe-shaped atoll enclosing a 19 km lagoon, featuring flat terrain, coral reefs, rich marine biodiversity, and proximity to the equator influencing a tropical maritime climate.

Administrative Status – Administered by the United Kingdom as part of the British Indian Ocean Territory (BIOT), with restricted civilian access and governed directly by a UK-appointed commissioner. It is currently inhabited by around 2,500 U.S. and U.K. military personnel and contractors, with no permanent civilian population after Chagossian displacement.

Historical Evolution – Detached from Mauritius in 1965 to form BIOT, followed by relocation of Chagossians (1968–73) to facilitate establishment of a U.S. military base.

Military Infrastructure – Hosts Naval Support Facility Diego Garcia with a 3.7 km runway, deep-water port, logistics hubs, satellite tracking, and pre-positioned military equipment.

Strategic Significance – Located near key sea lanes linking the Middle East, Africa, and Asia, enabling rapid force projection, surveillance, and refuelling operations across the Indo-Pacific.

6. IEA State of Energy Innovation 2026

Recently, the International Energy Agency released the State of Energy Innovation 2026, highlighting geopolitics-driven clean energy competition.

About IEA State of Energy Innovation 2026

The report assesses global trends in clean energy research, technology deployment, financing, and policy frameworks shaping the energy transition.

Key Findings of the 2026 Report

Geopolitical Drive – Many policies launched in 2025 by major economies prioritize technological leadership and supply chain security (e.g., US Genesis Mission, EU Competitiveness Fund).

Active Ecosystem – Over 320 new energy start-ups raised first-round funding in 2025, and energy-related patents continue to rise, constituting 1 in 10 global patents.

Battery Dominance – Energy storage (batteries) constitutes an unprecedented 40% of energy patents.

The “Valley of Death” Persists – Despite innovation, funding gaps remain between prototypes and commercial-scale deployment for new technologies.

Funding Dip – Public energy R&D spending is estimated to have dropped by 2% in 2025 to USD 55 billion, and VC investment shrank for the third consecutive year.

Technology Focus Areas as per the Report (2025–2026)

Nuclear Fusion – Major milestones were achieved in 2025 in Germany, the UK, China, France, and the US.

Perovskite Solar – Reached 33% efficiency, showing potential to expand the PV market.

Grid Technologies – The report highlights a critical need for grid-enhancing technologies (e.g., solid-state transformers, long-duration energy storage) to improve resilience.

Emerging Areas – Carbon dioxide removal, critical minerals, next-generation geothermal, and low-emissions industrial production are gaining traction.

About the International Energy Agency (IEA)

The IEA is an autonomous intergovernmental organisation established to promote reliable, affordable, and clean energy worldwide.

Members – It comprises 32 member countries, including the United States, United Kingdom, Germany, France, Japan, and Canada, along with 13 association countries including India.

Role and Functions – The IEA provides policy recommendations, data analysis, technology roadmaps, and emergency response coordination for global energy security and transition.

India and the IEA

Association Country Status – India is an association country, engaging closely with the IEA on energy data, policy dialogue, and transition pathways.

Energy Transition Goals – India aims to achieve 500 GW of non-fossil fuel capacity by 2030 while balancing energy security and development priorities.

Strategic Focus Areas – The report recommends India strengthen public R&D, secure critical mineral supply chains, and accelerate grid and clean technology deployment.

