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Twin Climate and Energy Crises: The Global Challenge of Fossil Fuel Dependence

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Recent Developments:

- At **London Climate Action Week 2026**, António Guterres warned that the world is simultaneously facing a deepening **climate crisis** and an escalating **energy crisis**, both rooted in continued dependence on fossil fuels.
- The UN Secretary-General emphasized that climate instability, geopolitical conflicts, energy insecurity and economic shocks are increasingly interconnected and require a coordinated global response.

Understanding the Twin Climate and Energy Crises:

Meaning and Nature of the Twin Crises:

- The concept refers to two interconnected global challenges arising from excessive reliance on **coal, oil and natural gas**.
- The first challenge is the **climate crisis**, where rising greenhouse gas emissions are pushing global temperatures toward dangerous and potentially irreversible ecological tipping points.
- The second challenge is the **energy crisis**, where geopolitical conflicts and disruptions in fossil fuel supply chains create energy shortages, inflationary pressures and economic instability.
- The two crises reinforce each other because dependence on fossil fuels simultaneously drives climate change and exposes economies to volatile energy markets.

Scale of the Crisis: Key Global Indicators:

Climate and Energy Warning Signals:

- The world has experienced the **11 hottest years on record**, with global temperatures approaching the **1.5°C threshold** established under the Paris Agreement.
- According to the **International Energy Agency (IEA)**, recent disruptions in West Asian energy markets have created shocks comparable to the oil crises of the **1970s** and the energy market disruptions following the **Russia–Ukraine conflict**.
- Elevated oil prices during regional conflicts generated approximately **$6.5 billion** in additional profits for the world's largest fossil fuel companies during the first quarter of **2026**.

Methane Emissions: A Critical Climate Challenge:

Importance of Methane Reduction:

- **Methane (CH_4)** contributes nearly one-third of present global warming and possesses a warming potential approximately **80 times greater than carbon dioxide** over a short-term period.
- Global oil and gas operations flared nearly **167 billion cubic metres** of natural gas during **2025**, representing a significant loss of energy resources.

- The **UNEP Methane Alert and Response System (MARS)** issued more than **5,000 alerts** across **33 countries**, yet the response rate from governments and industries remained low.
- The **Global Methane Pledge**, launched during COP26, seeks a **30% reduction in methane emissions by 2030** compared with 2020 levels.

Artificial Intelligence and Environmental Footprints:

Emerging Sustainability Concerns:

- Rapid expansion of **Artificial Intelligence (AI)** infrastructure is increasing electricity demand across the world.
- By **2030**, commercial AI data centres are projected to consume more electricity than most countries globally.
- Cooling systems used in data centres could significantly increase freshwater consumption, creating additional pressure on already stressed water resources.
- Growing digital infrastructure highlights the need to align technological development with sustainability goals.

Renewable Energy Transition: Emerging Opportunities:

Declining Costs of Clean Energy Technologies:

- Since **2010**, solar energy costs have declined by nearly **90%**, onshore wind costs by more than **70%**, and battery storage costs by approximately **95%**.
- According to the **International Renewable Energy Agency (IRENA)**, existing renewable energy installations helped save around **$480 billion** in avoided fossil fuel expenditures during **2025**.
- Falling technology costs are strengthening the economic competitiveness of renewable energy relative to fossil fuels.
- Renewable energy deployment contributes simultaneously to climate mitigation, energy security and economic resilience.

Climate Finance and Global Investment Gap:

Unequal Distribution of Green Investments:

- Despite possessing nearly **60% of the world's best solar resources** and approximately **30% of critical minerals**, Africa receives only a small fraction of global clean energy investment.
- More than **600 million people** in Africa continue to lack reliable electricity access.
- Developing countries often face borrowing costs that are **two to three times higher** than those faced by advanced economies for green infrastructure projects.
- Limited access to affordable finance remains a major barrier to global energy transition efforts.

Major Climate Tipping Points Identified:

Potential Irreversible Ecological Changes:

- Rising ocean temperatures threaten widespread **coral reef bleaching and collapse**, affecting marine biodiversity and fisheries.
- Accelerated melting of the **Greenland** and **West Antarctic Ice Sheets** could substantially raise global sea levels.
- Weakening ocean circulation systems may alter weather patterns and affect agricultural productivity across multiple continents.
- Portions of the Amazon Rainforest could gradually transition into dry savanna-like ecosystems if climatic thresholds are crossed.
- Crossing tipping points may trigger self-reinforcing environmental changes that are difficult to reverse.

Barriers to Clean Energy Deployment:

Structural and Institutional Challenges:

- Existing electricity transmission networks are often unable to accommodate large-scale renewable energy integration.
- Insufficient grid-scale battery storage limits the ability to balance intermittent solar and wind power generation.
- Lengthy approval procedures and regulatory delays slow the development of renewable energy projects.
- Financial risks and high borrowing costs discourage investment in developing countries.
- Supply chain constraints for critical minerals and clean technologies can further slow energy transition efforts.

Policy Responses Suggested by the United Nations:

Measures to Accelerate the Energy Transition:

- Governments should consider taxing extraordinary profits earned by fossil fuel companies during energy crises and redirect resources toward renewable energy expansion.
- A global framework for **near-zero methane emissions** across the oil and gas value chain should be established using available low-cost technologies.
- Major AI companies should disclose the **carbon, water and land footprints** associated with their operations.
- Data centres should progressively transition toward **100% renewable energy-powered operations**.
- Developed countries should fulfil climate finance commitments and support developing countries in their transition pathways.
- Expansion of lending by **Multilateral Development Banks (MDBs)** can reduce financing barriers through guarantees, local currency financing and debt-for-climate swaps.
- Global leaders should strengthen cooperation before future climate negotiations to ensure a just and equitable energy transition.

Significance for India:

Implications for India's Development Pathway:

- India remains highly dependent on imported crude oil and is therefore vulnerable to external energy shocks.
- Expansion of renewable energy supports India's goals of **energy security, emission reduction and sustainable growth**.
- Strengthening grid infrastructure, battery storage and green hydrogen production is essential for achieving long-term climate objectives.
- India's initiatives such as the International Solar Alliance, Coalition for Disaster Resilient Infrastructure and the **National Green Hydrogen Mission** contribute to global climate action efforts.

Way Forward:

Building a Resilient Low-Carbon Economy:

- Accelerating renewable energy deployment, improving energy efficiency and reducing methane emissions are essential for limiting global warming.
- Climate finance mechanisms must become more accessible and affordable for developing economies.
- Energy transition policies should protect vulnerable communities, workers and fossil fuel-dependent regions.
- Technological innovation, international cooperation and sustainable consumption patterns must complement climate mitigation efforts.

- Reducing dependence on fossil fuels remains the most effective long-term strategy for addressing both climate and energy crises simultaneously.

Value Addition for UPSC:

Important Reports, Initiatives and Concepts:

- **Paris Agreement (2015):** Aims to keep global temperature rise well below **2°C** and pursue efforts to limit warming to **1.5°C**.
- **Global Methane Pledge (2021):** Targets a **30% reduction** in methane emissions by **2030**.
- **Loss and Damage Fund:** Established under COP28 to support climate-vulnerable developing countries.
- **Climate Tipping Point:** A threshold beyond which environmental changes become self-sustaining and difficult to reverse.

Just Energy Transition: A transition that balances decarbonisation with employment security, social justice and economic stability