NEXT IAS

DAILY EDITORIAL ANALYSIS

TOPIC

International Cooperation on Clean Energy and Cooling Solutions

INTERNATIONAL COOPERATION ON CLEAN ENERGY AND COOLING SOLUTIONS

Context

- In a rapidly warming world, the need for effective cooling solutions has become more critical than ever. International cooperation on clean energy and cooling solutions is essential to address the dual challenges of climate change and energy efficiency.

Current State of Global Warming

- According to UNEP, global temperatures have already risen by approximately 1°C since pre-industrial times.
  - It has led to more frequent and severe weather events, including heatwaves, floods, and wildfires.
- The **UNEP's Emissions Gap Report** underscores that current efforts are insufficient to meet the targets set by the **Paris Agreement**, which aims to limit global warming to well below 2°C, preferably to 1.5°C.

Urgency of Sustainable Cooling

- As global temperatures rise and experiencing extreme heat waves episodes globally, the demand for cooling is expected to surge, and **expected to triple by 2050**.
- **Traditional cooling methods**, which rely heavily on **hydrofluorocarbons (HFCs),** contribute significantly to greenhouse gas emissions.
- By 2050, **India** alone may have the **world's highest cooling demand,** with over 1.14 billion air conditioners in use, making it imperative to adopt sustainable and energy-efficient solutions.
  - **India, as the third-largest emitter of greenhouse gases**, plays a crucial role in global efforts to combat climate change.

Key Concerns For Clean Energy and Cooling Solutions

- **Energy Efficiency and Emissions:** Inefficient air-conditioning and refrigeration systems not only consume excessive amounts of energy but also contribute significantly to greenhouse gas emissions.
- **Harmful Refrigerants:** Another major concern is the use of hydrofluorocarbons (HFCs) in cooling appliances that can contribute significantly to global warming if left unchecked.
- **Access to Sustainable Cooling:** Access to sustainable cooling is a pressing issue, **particularly in climate-vulnerable regions**.
  - Around 1.12 billion people are at high risk due to a lack of access to cooling, with the most acute gaps in poor rural areas of Sub-Saharan Africa and growing cities in high-temperature regions of the Global South.
- **Technological Gaps:** There is a persistent digital divide and a lack of access to advanced technologies in many parts of the world.
  - It hinders the deployment of clean energy solutions and efficient cooling systems, which are crucial for mitigating climate change and addressing energy poverty.
- **Policy and Regulatory Barriers:** Inconsistent policies and regulatory frameworks across countries can impede the adoption of sustainable technologies.
  - The lack of integrated energy efficiency and refrigerant standards, for example, slows down the transition to cleaner cooling solutions.
- **Coordination and Collaboration:** Effective global partnerships require seamless coordination among various stakeholders, including governments, private sector, and civil society.
  - However, differing priorities and interests can make collaboration challenging.
- **Adaptation Gap**: The **UNEP's Adaptation Gap Report** reveals that the costs of adaptation are likely to be between $140-300 billion per year by 2030 and $280-500 billion per year by 2050 for developing countries alone.

Addressing Climate Change and Energy Poverty

- **Public-Private Partnerships (PPPs):** PPPs offer a viable mechanism for creating sustainable and resilient infrastructure.

- By leveraging the strengths of both public and private sectors, PPPs can drive the development and deployment of clean energy technologies.

- **Innovative Financing Mechanisms:** New financial instruments, such as green bonds and climate funds, can help mobilise the necessary resources for climate action.
  - These mechanisms can attract private investment and provide the financial support needed for large-scale projects.
- **Technology Transfer and Capacity Building:** Sharing technologies and building local capacities are essential for sustainable development. International cooperation can facilitate the transfer of advanced technologies to developing countries, helping them leapfrog to cleaner and more efficient energy systems.
- **Community Engagement:** Involving local communities in the planning and implementation of clean energy projects can enhance their effectiveness and sustainability.
  - Community-driven approaches ensure that solutions are tailored to local needs and contexts.

International Efforts and Commitments

- **Quad's Wilmington Declaration:** Recently, the **Quad nations (Australia, India, Japan, and the United States)** issued the **Wilmington Declaration**, emphasising their commitment to sustainable energy solutions, particularly high-efficiency cooling systems.
  - It aligns with the earlier joint statement by India and the United States, which outlined a roadmap for building resilient and secure global clean energy supply chains, with a special focus on clean cooling technologies.
- **Global Cooling Pledge**: Launched by the **COP28 Presidency** and supported by UNEP, it aims **to enhance voluntary commitments** to climate mitigation, adaptation, and resilience through sustainable cooling.
  - It calls for progress on nature-based solutions, super-efficient appliances, and **National Cooling Action Plans.**
- **India's Leadership:** As part of the Quad's clean energy initiatives, India has pledged significant **investments in solar and cooling infrastructure across the Indo-Pacific region**.
  - Additionally, India and the U.S. have collaborated to expand manufacturing capacities for high-efficiency air-conditioners and ceiling fans, which could significantly reduce the climate impact of cooling systems.

Kigali Amendment and Its Impact

- The broader relevance of these international efforts can be seen through the lens of the **Montreal Protocol and its Kigali Amendment (2016)**, which set a precedent for collective global action on cooling-related emissions.
- The Kigali Amendment targets HFCs, potent greenhouse gases used in cooling appliances.
  - HFCs could contribute to **0.52°C of warming by 2100**, if left unchecked.
- Aligning the HFC phase-down with energy efficiency improvements could deliver about two-thirds of total greenhouse gas reductions by cutting electricity consumption.

Conclusion

- Climate change has heightened two critical threats related to cooling: the indirect emissions from inefficient air-conditioning and refrigeration systems powered by fossil fuels, and the direct emissions from harmful refrigerants.
- Addressing these challenges requires a concerted global effort to deploy affordable and energy-efficient cooling systems in climate-vulnerable regions while advancing global climate goals.
- International cooperation, as demonstrated by the Quad nations and the commitments under the Kigali Amendment, is essential for a sustainable and cooler future.

Source: TH

Mains Practice Question

[Q] Discuss the critical role of international cooperation in accelerating the transition to clean energy and sustainable cooling solutions. Examine the key challenges and opportunities in fostering global partnerships, sharing technologies, and mobilising financial resources to address climate change and energy poverty.