

Daily Editorial Analysis 4 October 2025

October 4, 2025 • vajiramandravi.com

India's Clean Energy Rise Needs Climate Finance Expansion

Context

- India's clean energy transition has gained global recognition for its rapid scale and ambition; **In 2024 alone, the country added 24.5 gigawatts (GW) of solar energy capacity**, becoming the third-largest contributor worldwide after China and the United States.
- **This accomplishment**, alongside its leadership in creating the International Solar Alliance (ISA), **places India at the forefront of the global shift towards renewables.**
- However, **beneath the success stories lies a significant financial gap** that threatens to slow the pace of transformation.
- **Without adequate and innovative climate finance mechanisms, India risks falling short** of both its national and international climate commitments.

India's Rising Leadership in Renewable Energy

- India's clean energy sector has **expanded at an impressive rate**, making it a central player in the global renewable energy landscape.
- The United Nations **Secretary-General's 2025 Climate Report highlights India**, alongside Brazil and China, as a leading developing nation in scaling up solar and wind energy.
- This **progress is not merely environmental but also economic.**
- By 2023, **the renewable energy sector employed over one million people** and contributed nearly 5% to India's GDP growth.
- **Off-grid solar solutions alone created 80,000 jobs in 2021**, reflecting the sector's potential for inclusive growth.
- Moreover, the International Renewable Energy Agency (IRENA) projects that **if India follows a 1.5°C-aligned pathway, it could achieve average annual GDP growth of 2.8% through 2050**, more than double the G20 average.
- This **illustrates the economic case for clean energy**, particularly through technologies such as decentralised grids, battery-integrated renewables, and green hydrogen.

The Critical Gap: Financing the Transition

- Despite this remarkable progress, **India faces a pressing financial challenge.** To remain on track with its climate targets, India requires between \$1.5 trillion and \$2.5 trillion by 2030.

- **These funds are essential not only for scaling renewable energy but also for modernising electricity grids**, deploying battery storage, advancing sustainable transport, and ensuring climate-resilient agriculture.
- **Current climate finance flows remain inadequate** to meet this scale of investment.
- While India's green finance market has shown growth, with cumulative green, social, sustainability and sustainability-linked (GSS+) debt issuance reaching \$55.9 billion by 2024, the funding remains concentrated.
- **Green bonds**, which account for over 80% of this issuance, **have primarily benefited large corporations**.
- **Micro, small, and medium enterprises (MSMEs)**, local infrastructure projects, and agri-tech innovators **often struggle to access climate finance due to high risks** and lack of concessional funding.
- This **imbalance underscores the need for diversified strategies** that extend beyond large corporate players.

The Way Forward

- **Expanding the Climate Finance Strategy**
 - To bridge the financial gap, **India must diversify its climate finance instruments** and strengthen policy frameworks.
 - **Public finance will play a catalytic role**. National and state governments can leverage budgetary allocations and fiscal incentives to de-risk green projects, thereby attracting private investment.
 - **Blended finance models**, which combine public and private funds, represent a powerful tool in this effort.
 - **Instruments such as credit guarantees, subordinated debt, and risk-sharing mechanisms** can make renewable projects more attractive to private lenders.
 - For instance, **performance guarantees could unlock financing for mid-sized clean energy infrastructure** in smaller urban centres, where governance and delivery risks may otherwise deter investors.
- **Tapping Emerging Avenues: Carbon Markets and Innovation**
 - Beyond traditional finance, **India must also explore innovative approaches**.
 - **The launch of the Carbon Credit Trading Scheme** offers an opportunity to mobilise new funding streams, provided it is managed transparently and equitably.
 - Similarly, **financing for adaptation and loss-and-damage measures** must gain greater attention, ensuring vulnerable communities are not left behind.
 - **Technology-driven solutions** can also strengthen India's climate finance framework.
 - **Blockchain could improve transparency in tracking funds**, while Artificial Intelligence can enhance risk assessments for green portfolios.
 - **Tailored blended finance models that reflect India's diverse social and economic realities** will be critical in ensuring that the transition remains inclusive and scalable.

Conclusion

- **India has demonstrated global leadership** in renewable energy deployment and job creation, while also contributing meaningfully to international climate cooperation.
- Yet, **the journey ahead depends** on closing the **enormous climate finance gap**.
- **By diversifying financial instruments, unlocking institutional capital**, and embracing innovative tools such as carbon markets and AI-driven assessments, **India can not only meet its climate commitments but also drive inclusive, sustainable economic growth**.

India's Clean Energy Rise Needs Climate Finance Expansion FAQs

Q1. What achievement made India the third-largest contributor to global renewable energy in 2024?

Ans. India added 24.5 gigawatts of solar energy capacity in 2024, making it the third-largest contributor after China and the United States.

Q2. Why is climate finance crucial for India's clean energy transition?

Ans. Climate finance is essential because India needs between \$1.5 trillion and \$2.5 trillion by 2030 to meet its clean energy and climate targets.

Q3. Which sectors face challenges in accessing green finance in India?

Ans. Micro, small, and medium enterprises, agri-tech innovators, and local infrastructure developers face challenges in accessing green finance.

Q4. How can India attract more private investment in renewable energy?

Ans. India can attract more private investment by using blended finance models, credit guarantees, and fiscal incentives to reduce investment risks.

Q5. What innovative tools can support India's climate finance system?

Ans. Tools like blockchain for tracking climate funds and Artificial Intelligence for assessing green investment risks can strengthen India's climate finance system.

Source: **The Hindu**

The Maritime Signalling After Operation Sindoor

Context

- While the **May 2025 standoff between India and Pakistan** unfolded primarily in the air domain, **subsequent developments indicate** that the focus of their **rivalry has shifted toward the maritime theatre**.
- Naval manoeuvres, statements from political and military leaders, and visible demonstrations of capability all suggest that **the Indian Ocean is becoming a central arena of competition**.
- Unlike past crises that remained confined to land and air, the growing salience of the sea reflects **both changing force postures and a wider geopolitical context shaped by Chinese and Turkish**

involvement.

Naval Posturing After the Air Crisis

• Indian Navy's Preparedness

- India's maritime activity since Operation Sindoor reflects **a shift toward forward deterrence and a more assertive naval posture.**
- Defence Minister Rajnath Singh's October warning, invoking the **1965 war, signalled a willingness to escalate in response to Pakistan's infrastructure buildup in Sir Creek.**
- Similarly, **Admiral Dinesh Tripathi's statement that the Navy would be the first to act in future conflicts** underscores a doctrinal recalibration toward proactivity at sea.
- The **induction of INS Nistar and joint patrols with the Philippines in the South China Sea illustrate India's dual focus:** strengthening domestic capability while embedding itself more firmly within the Indo-Pacific strategic framework.

• Pakistan's Naval Posture

- **Pakistan, meanwhile, has responded with its own demonstrations.**
- The **launch of the Chinese-built Hangor-class submarine PNS Mangro** and the unveiling of the P282 ship-launched ballistic missile showcase an expanding arsenal.
- **Naval dispersal from Karachi to Gwadar, intended to reduce vulnerability,** signals strategic adaptation, while overlapping missile tests and live-fire drills maintain operational pressure on India.
- **Together, these moves demonstrate that Pakistan is no longer content to concede maritime inferiority,** but rather seeks to complicate Indian operational planning and deny uncontested dominance in the Arabian Sea.

Escalation Risks at Sea

- Unlike aerial skirmishes, **naval confrontations present a unique challenge for escalation control.**
- Ships and submarines, **once deployed, linger in contested waters, making disengagement slower and costlier.**
- **Memories of India's decisive naval blockade in 1971 continue to shape Pakistan's maritime outlook,** motivating its pursuit of anti-access/area-denial capabilities and reinforcing its emphasis on deterrence-by-denial.
- **The psychological weight of Gwadar and Karachi adds to the volatility.** Both are more than logistical hubs, they are strategic pressure points embedded within Pakistan's national security psyche.
- Any **Indian naval action against these sites risks being interpreted as existential,** potentially triggering escalation beyond limited aims.
- **The prospect of Chinese involvement through the People's Liberation Army Navy (PLAN) further heightens the stakes,** narrowing the space for coercion short of war.

The External Dimension

- India and Pakistan's naval manoeuvres **must also be read in a wider geopolitical context.**
- **China's presence in Gwadar and Karachi raises the possibility of PLAN involvement in a crisis,** eroding India's traditional dominance in the Indian Ocean.
- **Türkiye's growing role, primarily as a supplier of Babur-class corvettes** and naval training, introduces another external actor into the maritime balance.
- **For India, joint patrols in the Indo-Pacific and indigenous shipbuilding efforts signal intent to integrate its maritime strategy** with broader regional security concerns.
- At the same time, **Pakistan's modernisation trajectory underscores its intent to prevent a repeat of 1971,** when its navy was decisively outmatched.
- The **interplay of external partnerships thus complicates deterrence,** introducing uncertainty into crisis planning on both sides.

Doctrinal Shifts and Strategic Drift

- **Both India and Pakistan appear to be adapting their naval doctrines to reflect new realities,** yet they remain constrained by precedents from past crises.
- **India is under pressure to leverage its naval advantages as a coercive tool,** while Pakistan continues to invest in capabilities designed to offset asymmetry.
- However, **technological innovations, from hypersonic missiles to unmanned systems, are reshaping the escalatory ladder** in ways that traditional assumptions may no longer capture.
- This **creates a risk of strategic drift.** If decision-making in future crises remains anchored to outdated frameworks, miscalculation becomes more likely.
- **At the same time, the continuous presence of naval forces may paradoxically develop mutual awareness,** reducing the fog of war through repeated observation and interaction.
- In this sense, **the maritime domain may provide both heightened risks and unexpected stabilising effects.**

Conclusion

- **Naval exercises, missile tests, and capability inductions** suggest that both sides are preparing for the possibility of confrontation at sea.
- **India retains advantages in numbers and geography,** but Pakistan's modernisation, combined with Chinese and Turkish involvement, is narrowing the gap.
- **Ultimately, India faces a choice: whether to treat the maritime theatre as an arena for early signalling in crises, or to hold it in reserve** as an escalatory lever.
- Either way, **the next India-Pakistan confrontation is unlikely to remain confined to the skies;** the Indian Ocean is fast becoming the new frontier of their enduring rivalry.

The Maritime Signalling After Operation Sindoor FAQs

Q1. What recent shift has occurred in the India-Pakistan strategic rivalry?

Ans. The rivalry has shifted from the air domain to the maritime theatre, with both countries increasing naval activity and signalling readiness for escalation at sea.

Q2. How has India demonstrated its enhanced naval posture after Operation Sindoor?

Ans. India has adopted a forward deterrent posture by inducting new vessels like INS *Nistar* and conducting joint patrols in the South China Sea, signalling both capability and regional engagement.

Q3. What key steps has Pakistan taken to strengthen its naval capability?

Ans. Pakistan has launched the Hangor-class submarine *PNS Mangro*, developed the P282 ship-launched ballistic missile, and dispersed its fleet between Karachi and Gwadar to reduce vulnerability.

Q4. Why is escalation control more difficult in the maritime domain?

Ans. Naval engagements are harder to manage because ships remain deployed for long periods, increasing the risk of miscalculation and making disengagement more complex than in aerial conflicts.

Q5. What external factors are influencing the India-Pakistan maritime balance?

Ans. Chinese involvement through the PLAN in Gwadar and Karachi, along with Türkiye's supply of naval assets, has introduced new uncertainties into the regional maritime equation.

Source: **The Hindu**

Source: <https://vajiramandravi.com/current-affairs/daily-editorial-analysis-4-october-2025/>

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