



Powering partnership: India-Vietnam energy cooperation in the era of renewable transition

Jyoti

Research Scholar, Department of Political Science, Maharshi Dayanand University, Rohtak, Haryana, India

Corresponding Author: Jyoti

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Abstract

The accelerating global shift towards renewable energy has opened new avenues for strategic cooperation between India and Vietnam, two emerging economies with convergent interests in sustainable growth and energy security. As both countries face rising energy demand alongside climate commitments, renewable energy has become a critical pillar of their bilateral engagement. India's expanding capabilities in solar, wind, and green hydrogen technologies complement Vietnam's ambition to diversify its energy mix and reduce dependence on fossil fuels. Institutional mechanisms under the India–Vietnam Comprehensive Strategic Partnership have facilitated closer collaboration in clean energy research, policy dialogue, and private sector participation. Memoranda of understanding between industry associations and government agencies have promoted technology exchange, skill development, and joint ventures in solar and wind power. These initiatives reflect a shift from traditional energy cooperation towards future-oriented, low-carbon solutions.

Investment cooperation has further strengthened this partnership. Indian renewable energy firms have explored opportunities in Vietnam's fast-growing clean energy market, while Vietnam has expressed interest in India's experience with large-scale renewable deployment and grid integration. Engagement through multilateral platforms, including regional climate and energy forums, has reinforced shared commitments to sustainable development and regional energy resilience. In a broader geopolitical context, India–Vietnam energy cooperation contributes to stability and economic integration in the Indo-Pacific. By aligning renewable energy goals with strategic trust and economic complementarities, the partnership demonstrates how South–South cooperation can support the global energy transition. Sustained policy coordination and investment will be essential to translate this potential into long-term, tangible outcomes.

Keywords: India–Vietnam relations, Renewable energy transition, Energy cooperation, Sustainable development, Indo-Pacific energy security

Introduction

The strategic relationship between India and Vietnam has evolved sustainably over the past decade, expanding beyond traditional security and trade linkages to include cooperation in energy security and sustainable development. As two rapidly developing economies in the wider Indo-Pacific region, both countries face the challenge of meeting growing energy demands while fulfilling climate commitments and transitioning towards cleaner sources of power. Energy cooperation increasingly sits at the intersection of economic growth, climate diplomacy, and renewable energy collaboration, forming a pivotal component of the India–Vietnam comprehensive strategic partnership.

India's domestic energy landscape has witnessed a dramatic shift towards renewable energy expansion. The country has set an ambitious target to reach 500 GW of installed renewable capacity by 2030, significantly increasing its share of non-fossil energy in the overall power mix. These goals align with India's commitments under the Paris Agreement and broader decarbonisation efforts, with solar and wind energy at the forefront of its clean energy drive. In recent years, India has achieved key milestones in solar deployment and non-fossil capacity, reflecting accelerated investment and policy support for renewable infrastructure.

Vietnam, on its part, has responded to surging electricity demand and environmental pressures by adopting an increasingly ambitious power development plan that emphasises robust expansion of solar and wind capacity. With targets for significant increases in renewable capacity. With targets for substantial increases in renewable capacity by 2030 and net-zero ambition by 2050, the country aims to reduce dependence on coal while attracting investment and technology partnerships in the renewable sector. The Vietnamese government's policy direction has opened avenues for foreign participation in green energy projects and technology exchange, underscoring renewable energy as a cornerstone of its long-term development strategy.

Bilateral energy cooperation between India and Vietnam reflects these complementary priorities. Historical interactions in the oil, gas, and conventional power sectors have gradually broadened to include renewable energy projects and policy dialogue. Notable initiatives have included solar energy partnerships, such as the signing of a Memorandum of Understanding (MOU) for solar cooperation, and Indian firms executing solar photovoltaic projects in Vietnam. These collaborative efforts underscore both countries' recognition of the strategic importance of energy diversification and technological collaboration in renewables.

Beyond economic considerations, renewable energy cooperation serves as a platform for deeper diplomatic engagement within the broader Indo-Pacific geopolitical framework. As regional energy integration and sustainability become focal points of multilateral discussions, India and Vietnam's joint clean energy initiatives align with broader regional commitments to climate action and energy security. The convergence of energy priorities not only enhances bilateral ties but also contributes to regional resilience and sustainable development objectives.

This paper examines the drivers and policies. And the outcomes of India-Vietnam energy cooperation in the context of the renewable transition. By analysing national strategies, bilateral agreements, and recent project developments, it assesses the dynamics of this partnership. It identifies opportunities for strengthened collaboration in advancing shared energy security and environmental goals.

India's renewable energy landscape

India's renewable energy sector has emerged as a dynamic, rapidly expanding component of the country's overall power system, driven by ambitious government targets, supportive policies, and rising private investment. As part of its commitments under the Paris Agreement, India aims to substantially reduce its carbon emission intensity while scaling up clean power generation to meet its growing energy needs sustainably. Central to this vision is the target of achieving 500 GW of non-fossil fuel installed capacity by 2030. This goal encompasses solar, wind, bioenergy, and small hydro power sources, reflecting a comprehensive approach to decarbonising the energy mix.

By mid-2025, India's installed renewable capacity had grown significantly, with total non-fossil fuel capacity, including renewables, hydro, and nuclear, accounting for about 50 per cent of the nation's total electricity capacity, a milestone reached ahead of schedule. Renewables, excluding large hydro, contributed more than 17 per cent of electricity generation, marking the fastest output growth in several years.

Solar power has been the primary driver of India's renewable expansion. In the first half of 2025, India added substantial solar and wind capacity, with solar installations accounting for a significant portion of the growth, reflecting strong market demand and competitive pricing that increasingly undercuts traditional fossil-fuel generation costs.

Government incentives such as the production-linked incentive (PLI) scheme, enhanced transmission planning, and rooftop solar promotion under schemes like PM Surya Ghar: Muft Bijli Yojana. Have further accelerated adoption at both the utility and household levels. State-level contributions are also notable. Regions like Gujarat and Rajasthan have recorded significant additions to renewable capacity. Underpinned by progressive policy frameworks and investments in grid infrastructure that support renewable integration.

Despite this progress, challenges remain, including grid connectivity constraints, delayed power purchase agreements, and the need for enhanced energy storage solutions to manage intermittent generation. Industry stakeholders have urged regulatory reforms to streamline project execution and harness the full potential of renewable energy within India's broader

energy transition strategy. Overall, India's energy landscape demonstrates robust growth and evolving capacity, positioning the country as a key player in the global clean energy transition while laying the foundation for deeper international cooperation, including partnerships with countries such as Vietnam, focused on sustainable, green energy objectives.

Vietnam's energy transition strategy

Vietnam stands at a pivotal juncture in its energy evolution, seeking to balance burgeoning electricity demand, environmental sustainability, and long-term economic growth. Traditionally reliant on coal and hydropower, the country's energy strategy has been progressively reoriented toward renewables and low-carbon technologies as part of its broader commitment to achieving net-zero emissions by 2050 and enhancing energy security amid rising industrialisation and electrification demands.

A cornerstone of this strategic shift is Vietnam's National Power Development Plan VIII (PDP8), which charts the nation's energy trajectory from 2023 to 2050. Under PDP8, the share of renewable energy in the total energy mix is expected to grow substantially — potentially rising from around a quarter today to more than 60 % by mid-century. Solar and wind power are central to these ambitions, with solar capacity projected to reach nearly 189 GW by 2050 and wind capacity around 170 GW, reflecting both Vietnam's abundant natural resources and its ambition to transition to clean generation sources. However, hydropower's share is anticipated to diminish significantly as renewables take precedence.

Vietnam's long-term strategy is supported by a suite of regulatory and policy reforms to strengthen its clean energy ecosystem. Reforms introduced in 2025, such as Decrees 56 and 57, streamlined project approval procedures and institutional guidelines, clarified responsibilities and investment conditions for renewable energy, and promoted direct power purchase agreements. These regulatory adjustments are designed to attract private and foreign investment while enhancing operational clarity in a rapidly changing policy landscape.

To complement capacity targets, Vietnam is also innovating in market-based mechanisms to drive decarbonization. The launch of a pilot emissions trading scheme (ETS) in 2025 marks a significant step toward internalising carbon costs and incentivising cleaner energy practices across major sectors, including power, steel, and cement, contributing to the nation's climate goals. In parallel, hydrogen — particularly green hydrogen — is emerging as a strategic priority, with Vietnam's Hydrogen Energy Strategy outlining objectives to scale hydrogen production for domestic use and export, decarbonise industrial sectors, and foster a new clean-fuel market by mid-century.

Despite considerable ambition, Vietnam's transition is dynamic and faces practical challenges, including regulatory complexity, investment uncertainty, and infrastructure constraints. Nonetheless, the country's integrated policy framework, ambitious targets, and commitment to renewable growth position it as a significant actor in Southeast Asia's clean energy transition. This evolving landscape offers substantial opportunities for international cooperation,

particularly in technology exchange, finance, and capacity building — themes that are highly relevant to India–Vietnam energy collaboration in the era of renewable transition.

Evolution of India–Vietnam energy cooperation

The trajectory of energy cooperation between India and Vietnam reflects both countries' strategic priorities and shifting global energy paradigms. In the late 20th century, cooperation began with a focus on hydrocarbons, particularly oil and natural gas, as India sought to diversify its energy sources and Vietnam aimed to harness its offshore resources. In 1988, India's state-owned Oil and Natural Gas Corporation's international arm (ONGC Videsh Ltd) was awarded an exploration licence for Block 6.1 in Vietnam's Nam Con Son Basin, marking India's first significant foreign hydrocarbon project and laying the foundation for decades of energy engagement. India held a 45% stake in this joint offshore venture alongside partners including PetroVietnam and Russia's Rosneft, producing natural gas that contributed to Vietnam's domestic energy supply and deepened bilateral ties. Over the 1990s and early 2000s, this cooperation expanded through additional exploration and production agreements. ONGC Videsh acquired rights to Blocks 127 and 128 in 2006, illustrating Vietnam's openness to Indian participation in its continental shelf resources despite complex geopolitical sensitivities in the South China Sea. In this period, bilateral agreements were formalised within the emerging Strategic Partnership framework (signed in 2007), which explicitly recognised energy cooperation — especially oil and gas exploration — as a key pillar of bilateral relations. This paved the way for further institutionalisation of collaboration, including production-sharing contracts, exploration MoUs, and joint project planning, even as India balanced diplomatic sensitivities involving third-party claimants in the region.

The 2016 elevation of relations to a Comprehensive Strategic Partnership significantly broadened the scope of energy cooperation. Beyond traditional hydrocarbons, both countries began emphasising renewable energy, energy conservation, and climate-resilient technologies — a shift that reflects global decarbonisation trends and India's leadership in renewable deployment. A notable initiative was the 2020 MoU between the National Solar Federation of India and the Vietnam Clean Energy Association, which aimed to foster knowledge exchange, best practices, and business linkages in solar energy development. In joint statements, leaders of India and Vietnam reaffirmed cooperation in energy security, renewable energy, and clean technologies, as well as oil and gas exploration in Vietnam's continental shelf, underscoring a more diversified, forward-looking energy partnership. Institutional mechanisms supporting this evolution include regular bilateral joint commissions, energy working groups under the broader bilateral dialogue architecture, and coordinated engagement in multilateral platforms such as the International Solar Alliance, where Vietnam's participation could further facilitate collaboration in large-scale renewable deployment.

Together, these developments chart a transition from predominantly hydrocarbon-oriented cooperation to a more holistic energy partnership that aligns with contemporary imperatives of sustainability and decarbonisation, providing a fertile foundation for deeper India–Vietnam collaboration in the era of renewable transition.

Strategic and geopolitical dimension

The strategic and geopolitical dimension of India–Vietnam energy cooperation extends far beyond bilateral economics; it is deeply interwoven with regional security dynamics, shared visions for a free, open, and rules-based Indo-Pacific, and the broader balance of power in East and Southeast Asia. India and Vietnam's Comprehensive Strategic Partnership reflects not only mutual economic interests but also convergent concerns regarding regional stability and a commitment to international law — particularly in maritime domains such as the South China Sea, where both countries emphasise peaceful resolution of disputes in accordance with the United Nations Convention on the Law of the Sea (UNCLOS).

Vietnam occupies a critical geopolitical position along key international sea lanes in the South China Sea that link the Indian Ocean to the Pacific, making it indispensable in any regional strategy focused on energy security, maritime trade flows, and strategic balance. Its strategic salience has only grown as the Indo-Pacific concept has gained currency in global geopolitics, with India's Act East Policy and Indo-Pacific Oceans Initiative (IPOI) explicitly positioning Vietnam as a key partner in promoting a stable, free and open regional order.

Energy cooperation, especially in renewable sectors, thus assumes strategic significance beyond capacity building and decarbonisation. Sustainable energy ties can function as complementary pillars to broader security cooperation by strengthening mutual interdependence and resilience against regional disruptions. Academic analyses highlight that collaborative energy frameworks — particularly those aligned with international standards and multilateral platforms such as the International Solar Alliance — can reinforce diplomatic trust, diversify strategic partnerships, and mitigate vulnerabilities associated with over-dependence on traditional energy suppliers or on contested maritime routes.

Geopolitical competition — particularly with China — further underscores the strategic value of India–Vietnam energy cooperation. Vietnam's efforts to balance relations with major powers while maintaining sovereignty and regional autonomy place it at the centre of strategic rivalries in Southeast Asia. India's sustained engagement in energy, defence, and maritime security helps enhance Vietnam's capacity to navigate these competitive pressures, while also enabling India to expand its strategic footprint in a region where emerging powers increasingly shape security architectures.

In this context, cooperation on renewable energy — through joint policy dialogue, shared technology development, and institutional mechanisms — serves a dual purpose. It advances economic and environmental objectives, and simultaneously strengthens the strategic partnership required to navigate complex geopolitical challenges. In doing so, India and Vietnam not only reinforce bilateral ties but also help shape a more stable, resilient, and equitable Indo-Pacific security and energy landscape.

Constraints and future prospects

Despite promising developments in India–Vietnam energy cooperation, several constraints continue to impede the full realisation of collaborative renewable energy initiatives. A

significant challenge lies in policy inconsistency and regulatory uncertainty. Vietnam's renewable energy sector, though rich in potential, has faced regulatory ambiguities related to feed-in tariffs, grid integration rules, and licensing procedures, which have, in some cases, discouraged foreign investment and complicated project execution. For example, retroactive changes to tariff frameworks risk undermining investor confidence and endanger billions in planned solar and wind assets, signalling broader institutional challenges in maintaining stable, predictable policies needed for long-term cooperation.

Financial and infrastructural barriers also pose significant constraints. High upfront costs for renewable installations, coupled with limitations in grid infrastructure and energy storage, can delay project delivery or reduce project viability. These challenges are not unique to Vietnam; similar issues have been documented across emerging economies, where grid bottlenecks and financing gaps slow down the transition from pilot projects to large-scale deployment.

On the Indian side, while renewable technologies have advanced rapidly and attracted significant domestic and foreign investment, grid integration and storage remain critical areas to scale solar and wind capacity reliably. Robust cross-border cooperation on standards, technology solutions (such as energy storage and smart grids), and financing mechanisms is therefore crucial for realising the full potential of joint ventures.

Yet these constraints coexist with notable prospects grounded in substantial institutional goodwill and complementary strengths. India's leadership in renewable capacity — now among the world's top markets for both solar and wind energy — provides a substantial foundation for technology transfer, best-practice sharing, and joint innovation platforms that can benefit Vietnam's expanding renewable segment. Vietnam's ongoing efforts to enhance its regulatory framework and diversify its energy mix — as outlined in its latest national power development and climate strategies — further create openings for sustained two-way cooperation.

Looking ahead, deepening collaboration in green hydrogen, offshore wind, and grid modernisation could become focal areas that align with broader strategic and climate objectives. Enhancing multilateral cooperation through platforms like the International Solar Alliance and structured capacity-building programmes will also support a more resilient, scalable partnership. If policy frameworks are clarified and stabilised, and if innovative financing tools are mobilised, India and Vietnam are well-positioned to co-lead renewable energy cooperation in the Indo-Pacific, advancing both economic growth and climate objectives in a rapidly transforming energy landscape.

Conclusion

The evolution of India–Vietnam energy cooperation reflects a broader transformation in bilateral relations shaped by shared strategic interests, developmental priorities, and the imperatives of the global energy transition. What began as a collaboration largely centred on offshore oil and gas exploration has gradually expanded into a more diversified, future-oriented partnership encompassing renewable energy,

clean technologies, and sustainability-driven policy dialogue. This shift mirrors the changing energy landscapes of both countries, as India advances large-scale renewable deployment and Vietnam accelerates its transition toward a low-carbon energy system.

As the analysis has shown, cooperation in solar and wind energy, private-sector investment, technology transfer, and capacity building has become increasingly relevant within the framework of the Comprehensive Strategic Partnership. These areas not only contribute to energy security and economic growth but also reinforce strategic trust and regional stability in the Indo-Pacific. At the same time, persistent challenges related to regulatory uncertainty, infrastructure constraints, and financing underscore the need for sustained policy coordination and institutional clarity.

Looking ahead, India–Vietnam energy cooperation has significant potential to become a model of South–South collaboration in the renewable era. By aligning national energy strategies, strengthening institutional mechanisms, and leveraging multilateral platforms, both countries can translate political intent into tangible outcomes. In doing so, the partnership can support climate goals, enhance regional energy resilience, and contribute meaningfully to a more sustainable and stable Indo-Pacific energy order.

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