

India's Energy Transition: Pathways to Net-Zero 2070

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Achieving Net-Zero Emissions by 2070

Executive Summary

India has embarked on an ambitious and strategic journey toward achieving net-zero emissions by 2070, a target that underscores its commitment to global climate action while prioritizing sustainable economic development. The nation's comprehensive strategy is built on a robust foundation of massive renewable energy deployment, an overhaul of grid infrastructure, and the implementation of sophisticated market-based mechanisms. A pivotal element of this transition is the accelerated target of reaching 500 gigawatts (GW) of non-fossil fuel energy capacity by 2030, a monumental increase from the current approximately 188 GW.

To facilitate this rapid scale-up and overcome inherent challenges, India is pioneering innovative approaches, including the strategic deployment of blended finance models, the successful issuance of sovereign green bonds, substantial investments in battery storage deployment, and the establishment of a robust carbon market. While confronting considerable hurdles in securing adequate financing, overcoming infrastructure development bottlenecks, and ensuring equitable access to advanced clean technologies, India's multi-faceted strategy positions it as a critical player in the global clean energy transition. This transformative journey is anticipated to generate millions of green jobs, catalyze significant technological innovation, and attract substantial domestic and international investment, thereby contributing to both environmental sustainability and economic prosperity.

1. Introduction

India's commitment to its Nationally Determined Contributions (NDCs) under the Paris Agreement is unwavering, with a resolute aim to reduce its greenhouse gas emission intensity by 45% by 2030 compared to 2005 levels. This ambitious climate action is not merely a global obligation but an integral component of India's long-term development strategy. The country's energy transition strategy represents a carefully balanced approach to addressing the existential threat of climate change while simultaneously ensuring continued economic growth and poverty alleviation. This transition is profoundly guided by Prime Minister Narendra Modi's "Panchamrit" climate action strategy, articulated at COP26 in Glasgow in 2021, which laid out a comprehensive roadmap for fundamentally transforming India's energy landscape while sustaining its economic trajectory.

India possesses demonstrable experience with market-based environmental mechanisms, notably the Perform, Achieve, and Trade (PAT) scheme. Since its inception in 2015, the PAT scheme has significantly improved energy efficiency across energy-intensive sectors, resulting in the abatement of over 106 million tonnes of CO2 emissions. Building upon this successful foundation, India is now broadening its approach through a multitude of complementary strategies and sophisticated policy frameworks, ensuring a holistic and effective transition.



2. Renewable Energy Expansion: Targeting 500 GW by 2030

At the very core of India's ambitious energy transition strategy lies the goal to achieve 500 GW of non-fossil fuel energy capacity by 2030. This monumental objective is the cornerstone of the nation's climate strategy, necessitating a rapid and unprecedented acceleration in renewable energy deployment across the country.

2.1 Current Status and Implementation Strategy

India has witnessed remarkable growth in its solar and wind power deployment capacities, a testament to robust government support and favorable policy environments. Key government initiatives driving this expansion include:

- **PM-KUSUM Scheme:** This scheme, Pradhan Mantri Kisan Urja Suraksha Evam Utthaan Mahabhiyan, is specifically designed to support solar adoption in the agricultural sector, promoting decentralized solar power generation and solarization of agricultural pumps. (Ministry of New and Renewable Energy, Government of India).
- **National Green Hydrogen Mission:** Launched to develop India as a global hub for green hydrogen production and export, this mission aims to decarbonize

hard-to-abate sectors and reduce reliance on fossil fuels. (Ministry of New and Renewable Energy, Government of India).

• New Offshore Wind Policies: Recognizing the vast potential of offshore wind energy, India has introduced new policies to encourage investment and development in this nascent sector, expanding renewable energy options beyond traditional land-based sources. (Ministry of New and Renewable Energy, Government of India).

2.2 Critical Focus Areas for Achievement

To materialize this massive scale-up, India is strategically focusing on three interconnected critical areas:

- **Grid Infrastructure Modernization:** The intermittent nature of renewable energy sources necessitates the creation of smarter, stronger, and more resilient transmission and distribution networks capable of handling variable power flows. This includes investments in advanced grid control systems, smart meters, and integrated energy management platforms.
- Energy Storage Solutions: Addressing the challenge of intermittency is paramount. India is heavily investing in the research, development, and deployment of diverse energy storage technologies, particularly battery storage, to ensure grid stability and reliability.
- **Green Finance Mobilization:** The sheer scale of investment required for this energy transition demands innovative and comprehensive funding mechanisms, ranging from sovereign green bonds to blended finance models, to attract substantial domestic and international capital.

3. Energy Storage and Grid Modernization

3.1 Battery Storage Expansion

Battery storage technology is unequivocally identified as a key enabler for India's renewable energy future, addressing the fundamental challenge of integrating intermittent solar and wind energy into the national grid. The country has set an ambitious target of deploying 50 GW of Battery Energy Storage Systems (BESS) by 2030.

To foster a robust domestic manufacturing capability and reduce reliance on imports, India is implementing strategic policies:

• **Production Linked Incentive (PLI) Schemes:** These schemes incentivize domestic manufacturing of Advanced Chemistry Cell (ACC) batteries, crucial for

both electric vehicles and grid-scale storage, by providing financial incentives on incremental sales from products manufactured in India. (NITI Aayog, Government of India).

- Viability Gap Funding (VGF): VGF provides financial support to make strategically important but financially unviable projects commercially viable, particularly in the nascent battery storage sector. (Ministry of Finance, Government of India).
- **Development of Indigenous Alternatives:** Alongside lithium-ion batteries, India is actively promoting research and development in indigenous alternatives such as sodium-ion and zinc-ion technologies, aiming to diversify its energy storage portfolio and enhance energy security. (Council of Scientific & Industrial Research, Government of India).

3.2 Grid Modernization Initiatives

Underpinning the successful integration of renewable energy is significant and continuous investment in upgrading and modernizing grid infrastructure:

- **Development of Green Energy Corridors:** These dedicated transmission lines are designed to efficiently transmit bulk renewable power from resource-rich regions (e.g., deserts for solar, coastal areas for wind) to demand centers across the country, minimizing transmission losses. (Power Grid Corporation of India Limited).
- Implementation of Smart Grid Technologies: This includes the adoption of advanced metering infrastructure, distribution automation, wide-area monitoring systems, and demand-side management tools for improved grid management, stability, and efficiency. (Ministry of Power, Government of India).
- Expansion of Transmission Infrastructure for Renewable Energy Zones: Targeted expansion of transmission networks specifically within and around designated renewable energy zones ensures evacuation of power from largescale solar and wind farms. (Central Electricity Authority).
- Rollout of Smart Meters under the Revamped Distribution Sector Scheme: This massive initiative aims to revolutionize electricity distribution management by enabling real-time monitoring of consumption, reducing AT&C losses, and facilitating demand-side management. (Ministry of Power, Government of India).

4. Transportation Sector Transformation

4.1 Electric Vehicle Targets and Support Programs

In the transportation sector, a critical area for decarbonization, India has set an ambitious target for 30% of all new vehicle sales to be electric by 2030. This transition is strategically supported by a comprehensive suite of policies and programs:

- FAME-II Scheme: The Faster Adoption and Manufacturing of Electric Vehicles (FAME-II) scheme is a cornerstone initiative, allocating ₹10,000 crore to provide significant subsidies for the purchase of one million electric two-wheelers, half a million electric three-wheelers, and 55,000 electric four-wheelers, thereby making EVs more affordable for consumers. (Ministry of Heavy Industries, Government of India).
- ₹18,100 Crore PLI Scheme for Advanced Chemistry Cell (ACC) Battery Manufacturing: This PLI scheme is crucial for creating a robust domestic EV ecosystem by incentivizing the production of advanced chemistry cell batteries, which are the heart of electric vehicles. (Ministry of Heavy Industries, Government of India).
- **State-Level Incentives:** Numerous Indian states, including Delhi, Maharashtra, and Tamil Nadu, have complemented national policies with their own unique state-level EV policies offering additional subsidies, road tax exemptions, and regulatory benefits, further accelerating adoption. (Respective State Transport Departments).
- **Charging Infrastructure Expansion:** Recognizing that adequate charging infrastructure is vital for EV adoption, the government and private players are actively working on developing a nationwide network of public and private charging stations, including fast-charging facilities. (Ministry of Power, Government of India; Society of Indian Automobile Manufacturers).

5. Innovative Financing Models for Green Transition

Addressing the substantial investment requirements for India's energy transition necessitates innovative and robust financing mechanisms.

5.1 National Investment and Infrastructure Fund (NIIF)

The National Investment and Infrastructure Fund (NIIF) exemplifies India's innovative approach to infrastructure financing. As a quasi-sovereign fund, NIIF is designed to catalyze investment by strategically combining public equity with private capital. The Government of India acts as the anchor investor, thereby attracting significant participation from global sovereign wealth funds, pension funds, and other institutional investors.

NIIF operates through three specialized vehicles:

- **Master Fund:** This fund focuses on achieving commercial returns by investing in core infrastructure sectors such as transportation, logistics, and energy, with a long-term investment horizon.
- **Fund of Funds:** This vehicle invests in private equity and venture capital funds managed by experienced fund managers, providing exposure to a diversified portfolio of infrastructure-related investments.
- Strategic Opportunities Fund: This fund makes strategic investments in growth sectors and companies that align with India's national development priorities, including new and emerging technologies in the clean energy space. (National Investment and Infrastructure Fund).

5.2 SEBI's Frameworks for Blended Finance

In a groundbreaking move in 2023, the Securities and Exchange Board of India (SEBI) introduced pioneering regulations for blended finance within Alternative Investment Funds (AIFs). This innovative framework allows AIFs to accept up to 20% concessional capital from philanthropic organizations or public institutions. This blended finance model is specifically designed to de-risk investments and crowd in larger institutional and private capital into critical Environmental, Social, and Governance (ESG) and climate-related sectors, thereby bridging funding gaps in sustainable development projects. (Securities and Exchange Board of India).

5.3 Sovereign Green Bonds Program

Since 2023, India has successfully established itself as a significant player in the global green finance market by raising a total of ₹36,000 crore through its sovereign green bond issuances. These bonds have been structured with various tenors to attract a diverse investor base:

- **5-year bonds:** Maturing in 2028 with a 7.25% coupon rate.
- **10-year bonds:** Maturing in 2033 with a 7.24% coupon rate.
- **30-year bonds:** Maturing in 2054 with a 7.37% coupon rate.

The proceeds from these green bonds are strategically deployed across several critical areas, ensuring alignment with India's climate objectives:

- Approximately 50% of the proceeds are allocated annually to energy-efficient electric locomotives, contributing to the decarbonization of the railway sector.
- ₹8,000 crore has been dedicated to metro projects in the current fiscal year, supporting sustainable urban mobility.
- ₹4,607 crore is directly supporting renewable energy projects, including initiatives under the National Green Hydrogen Mission.

 ₹124 crore has been allocated to afforestation initiatives under the National Mission for a Green India, contributing to carbon sequestration and biodiversity conservation.

While the program has seen overall success, recent auctions have reportedly faced some challenges with investor demand, indicating a need for continuous market engagement and potential adjustments in issuance strategies. Nevertheless, yields on Indian green bonds consistently remain marginally below those of standard government securities, indicating a positive "greenium" effect, where investors are willing to accept a slightly lower return for supporting environmentally friendly projects. (Reserve Bank of India; Ministry of Finance, Government of India).

6. Carbon Market Development

6.1 Carbon Credit Trading Scheme (CCTS)

The Energy Conservation (Amendment) Act, 2022, provides the robust legal foundation for the nascent Indian carbon market (ICM) and the ambitious Carbon Credit Trading Scheme (CCTS). This scheme is poised for launch by mid-2026, with trading potentially commencing earlier in some sectors as soon as April 2025. The CCTS is designed with two primary, complementary components:

- **Compliance Mechanism:** This mechanism targets obligated entities in energyintensive industries by setting mandatory Greenhouse Gas (GHG) emission intensity targets. It operates on a 'baseline-and-credit' principle, where entities that reduce emissions below their baseline earn credits, and those exceeding their baseline must purchase credits. The existing Perform, Achieve, and Trade (PAT) scheme, a proven energy efficiency mechanism, will gradually transition and integrate into this broader compliance framework.
- Offset Mechanism: This allows non-obligated entities to undertake voluntary projects that reduce, remove, or avoid GHG emissions. These entities can earn carbon credit certificates for their verified actions, providing an incentive for emission reductions in sectors such as agriculture, forestry, waste management, and other areas not covered by the compliance mechanism.

Significantly, on April 16, 2025, the government officially notified the "Greenhouse Gases Emission Intensity Target Rules, 2025" under both the Energy Conservation Act, 2001, and the Environment Protection Act, 1986. This crucial framework directly implements the Carbon Credit Trading Scheme and mandates specific emission intensity reduction targets for a significant number of companies in the aluminum, cement, and pulp and paper industries, marking a definitive step towards operationalization. (Ministry of Power, Government of India; Bureau of Energy Efficiency).

6.2 Governance Structure

A well-defined governance structure is essential for the effective functioning of the carbon market:

- **Bureau of Energy Efficiency (BEE):** The BEE serves as the central administrator for the CCTS. Its responsibilities include institutionalizing the carbon market, identifying eligible sectors and entities, setting emission targets, managing the issuance and verification of carbon credit certificates, and overseeing accredited verification agencies.
- National Steering Committee for Indian Carbon Market (NSCICM): Constituted by the Central Government, the NSCICM provides strategic direction and high-level oversight for the CCTS. It guides the market's overall development, establishes fundamental rules, sets broader targets, and recommends procedures for potential future linkages with international carbon markets. (Ministry of Power, Government of India).

6.3 Market Mechanisms and Trading Infrastructure

The trading of Carbon Credit Certificates (CCCs) will primarily occur on designated power exchanges approved by the Central Electricity Regulatory Commission (CERC), ensuring transparency in price discovery and efficient market operations. A national registry, managed by the Grid Controller of India (GCI), will be responsible for the issuance, tracking, and transfer of all CCCs, ensuring the integrity and traceability of credits.

Power exchanges will host two distinct segments: a Compliance market for obligated entities and an Offset market for voluntary projects. CCC prices will be determined through a bidding process on these power exchanges, potentially within a price range approved by CERC, based on recommendations from the BEE, allowing for marketdriven price discovery while maintaining a level of regulatory oversight. (Central Electricity Regulatory Commission; Grid Controller of India).

7. Multilateral Partnerships in Climate Finance

India is proactively engaging with a range of international institutions to mobilize critical financial and technical support for its climate transition.

• **Green Climate Fund (GCF):** The GCF is a vital mechanism for mobilizing the \$100 billion annual climate finance commitment made by developed nations to developing countries. India has successfully leveraged GCF funding for numerous impactful projects spanning large-scale clean energy deployment, the development of sustainable transportation systems, and initiatives aimed at enhancing disaster resilience across vulnerable regions. (Green Climate Fund).

- Asian Development Bank (ADB): The partnership with the ADB is multifaceted, focusing on accelerating renewable energy expansion, promoting energy efficiency improvements, developing climate-smart infrastructure, and strengthening disaster risk management capabilities. ADB's financial and technical support for India's ambitious renewable energy targets has been instrumental in catalyzing additional investment and providing crucial technical expertise. (Asian Development Bank).
- World Bank: The World Bank provides both significant financial assistance and valuable technical support to aid India's climate journey. Its focus areas include supporting low-carbon development pathways, facilitating renewable energy expansion, and promoting sustainable urban development practices. The World Bank has been particularly supportive of India's National Action Plan on Climate Change (NAPCC), a comprehensive strategy for addressing climate change. (World Bank).

These multilateral partnerships are crucial for creating powerful synergies through blended finance models. By combining concessional funding from these institutions with private capital, they significantly lower the perceived risks for commercial investors, thereby unlocking substantial private investment for climate-friendly projects in India.

8. Role of ESG Funds and Additional Market Instruments

8.1 ESG Funds

Environmental, Social, and Governance (ESG) funds are rapidly emerging as critical vehicles for financing India's sustainable transition. These funds specifically channel capital towards sustainable infrastructure projects, encompassing clean energy initiatives, green buildings, and low-carbon transportation systems.

The growing investor appetite for ESG products is being driven by a confluence of factors: increasing corporate and individual sustainability commitments, and an evolving global and domestic regulatory landscape that actively encourages and sometimes mandates responsible investment practices. As the ESG market in India matures, it is providing an essential and increasingly significant complement to public financing for India's ambitious climate objectives, facilitating the flow of private capital into green investments. (National Stock Exchange of India; Bombay Stock Exchange).

8.2 Additional Market Instruments

India is also actively exploring and developing various carbon market and pricing mechanisms to achieve its NDCs under the Paris Agreement. The country is focusing on frameworks that provide direct financial incentives for the adoption of low-carbon

technologies across a wide array of sectors, with a particular emphasis on "hard-toabate" industries that face significant challenges in decarbonization.

A key strategic benefit of these market-based approaches is the potential for revenue generation. Funds collected through carbon pricing mechanisms (e.g., carbon taxes, allowance auctions) can be strategically reinvested into further renewable energy projects, climate resilience programs, and technological innovation. This creates a virtuous cycle of climate action and sustainable development, where the very act of emissions reduction generates resources for further green growth. (Ministry of Finance, Government of India).

8.3 Carbon Accounting and ESG Reporting Standards

The global landscape of mandatory Environmental, Social, and Governance (ESG) reporting frameworks is undergoing rapid evolution, primarily driven by an escalating demand for transparency and accountability in corporate sustainability practices. A significant development in this regard is the European Union's **Corporate Sustainability Reporting Directive (CSRD)**, which became effective from January 1, 2024. This directive mandates detailed ESG disclosures for a broad range of large companies operating within the EU or having significant operations there, establishing comprehensive and standardized reporting requirements . This move aims to ensure that sustainability information is as reliable and comparable as financial information.

In the United States, the **Securities and Exchange Commission (SEC)** has proposed rules for climate-related risk disclosures, signalling a clear intent to enhance transparency around climate impacts and transition risks faced by publicly traded companies. Concurrently, to foster global comparability and reliability in sustainability reporting, the **IFRS Foundation** established the **International Sustainability Standards Board (ISSB)** in 2021. The ISSB is tasked with developing a global baseline of high-quality sustainability disclosure standards, building upon existing frameworks like the Task Force on Climate-related Financial Disclosures (TCFD) and the Sustainability Accounting Standards Board (SASB)¹. This initiative is crucial for creating a foundation for reliable and comparable ESG disclosures across diverse jurisdictions, benefiting investors and other stakeholders.

8.4 India's ESG Reporting Journey

India's journey in ESG reporting has seen significant progression, transitioning from voluntary disclosures to a more structured and mandatory framework. The early 2000s marked the nascent stages, with a few proactive companies voluntarily publishing sustainability reports. A pivotal moment arrived in 2012 when the **Securities and Exchange Board of India (SEBI)** introduced the mandate for **Business Responsibility Reports (BRR)** for the top 100 listed companies by market capitalization. This marked the first formal step towards structured ESG reporting in the country, encouraging

companies to report on their environmental and social performance alongside financial results.

This framework was substantially strengthened in 2018 when SEBI extended the robust ESG disclosure requirements to the top 1,000 listed companies. This expansion aimed to align Indian corporate practices more closely with internationally recognized reporting standards, such as the **Global Reporting Initiative (GRI)**, which provides a comprehensive framework for sustainability reporting, and the **UN Sustainable Development Goals (SDGs)**, encouraging companies to report on their contributions towards global sustainable development targets.

The most recent and significant advancement came in 2021 with SEBI's introduction of the **Business Responsibility and Sustainability Report (BRSR)**. The BRSR requires the top 1,000 listed companies to not only disclose detailed ESG information but also obtain independent assurance of specific ESG data points. This move is crucial for enhancing the credibility and reliability of reported information, bringing Indian reporting practices in line with leading global benchmarks.

8.5 Carbon Accounting Implementation

Within this evolving regulatory and reporting landscape, carbon accounting has gained critical importance, firmly underpinned by the fundamental principle that "what gets measured gets controlled". For Indian companies, particularly those engaged in international trade, compliance with evolving global regulations is becoming imperative. Specifically, for Indian companies that export to European markets or participate in EU supply chains, compliance with the **CSRD** requirements has become essential, as value chain reporting (including Scope 3 emissions) represents a key component of these guidelines.

Indian organizations are increasingly implementing various carbon accounting methodologies to quantify their greenhouse gas (GHG) emissions. The selection of a particular method often depends on the organization's specific goals, the availability and quality of data, and the desired level of accuracy for their emissions inventory.

The most widely adopted framework for categorizing and quantifying emissions is based on the **Greenhouse Gas (GHG) Protocol**, a globally recognized standard co-developed by the **World Resources Institute (WRI)** and the **World Business Council for Sustainable Development (WBCSD)**. This protocol categorizes emissions into three distinct scopes:

• Scope 1: Direct GHG emissions from sources that are owned or controlled by the reporting entity. This includes emissions from fuel combustion in owned vehicles, industrial processes, and facilities like thermal power generation plants.

- Scope 2: Indirect emissions from the generation of purchased electricity, steam, heating, and cooling consumed by the reporting entity. These emissions occur at² the utility provider's facilities but are a direct consequence of the reporting company's energy consumption.
- Scope 3: All other indirect emissions that occur throughout a company's entire value chain. This comprehensive category encompasses a wide array of sources, including emissions from the supply chain (raw material extraction, manufacturing of purchased goods), business travel, employee commuting, waste disposal, and the use and end-of-life treatment of sold products.

This robust classification system has evolved significantly to enable more comprehensive carbon footprint accounting and the development of effective reduction strategies. While initial GHG accounting efforts often focused primarily on Scope 1 and Scope 2 emissions, a growing awareness of the substantial environmental impacts originating from supply chains led to the introduction of Scope 3. This expansion allows organizations to capture their full lifecycle emissions, providing a more complete and accurate picture of their overall carbon footprint and enabling them to formulate more effective and holistic emission reduction strategies across their entire value chain.

9. Challenges and Path Forward

9.1 Key Challenges

Despite its ambitious strategies and significant progress, India faces several substantial challenges in its energy transition journey:

- **Financing Gap:** Mobilizing the colossal amounts of capital required for the massive renewable energy infrastructure, grid modernization, and clean technology deployment remains a significant hurdle. While innovative financing models are in place, the scale of investment needed is immense. (International Energy Agency; Council on Energy, Environment and Water).
- Land Acquisition Hurdles: Securing adequate physical space for large-scale renewable energy projects (solar parks, wind farms) can be a complex and time-consuming process due to land ownership issues, environmental clearances, and local community concerns.
- **Grid Infrastructure Limitations:** Despite ongoing modernization efforts, the existing transmission and distribution networks often require substantial upgrades and smart grid solutions to effectively handle the variability and

distributed nature of renewable energy sources without compromising grid stability.

- **Technology Access:** Ensuring the availability of cutting-edge clean technologies (e.g., advanced battery chemistries, green hydrogen electrolyzers) at affordable costs and fostering domestic manufacturing capabilities remains crucial.
- **Policy Integration and Coherence:** Aligning various policies, regulations, and initiatives across different ministries and levels of government for maximum effectiveness and avoiding potential conflicts or redundancies is a continuous challenge.
- Market Participation: Ensuring inclusive participation in new market mechanisms, especially for Micro, Small, and Medium Enterprises (MSMEs) which may have limited resources or technical expertise, is vital for a just transition.
- **Data Quality and Transparency:** Building robust and credible monitoring, reporting, and verification (MRV) systems for emissions and project impacts is essential to ensure the integrity and effectiveness of climate policies and market mechanisms.

9.2 Future Developments and Path Forward

Several key developments are anticipated in the near future that will shape India's energy transition:

- **Carbon Market Expansion:** The full operationalization of the Indian Carbon Market (ICM) by mid-2026 is expected, with a gradual expansion to include more sectors and a wider range of greenhouse gases beyond just CO2 and PFCs as the market matures and gains experience.
- International Integration: Significant progress is expected in exploring and potentially linking with global carbon markets under Article 6 of the Paris Agreement. Key decisions and frameworks related to international carbon credit trading are anticipated in the coming year, which could unlock new financing avenues and increase market liquidity.
- **Technology Innovation and Indigenous Manufacturing:** Continued strategic investment in research, development, and deployment of energy storage solutions (including flow batteries and other emerging technologies), advanced smart grid technologies, and strengthening indigenous manufacturing capabilities for clean energy components will be paramount.
- **Financial Instrument Evolution:** Potential evolution of carbon market mechanisms to include auction-based systems for emission allowance

allocation, moving beyond initial free allocation, and the development of market stability mechanisms to manage price volatility.

• **Regulatory Framework Refinement:** Continuous refinement and development of clear, transparent, and robust procedures for carbon credit issuance, validity, verification, and pricing will be crucial for building market confidence and attracting investment.



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10. Conclusion

India's multi-faceted and ambitious approach to its energy transition represents a significant and decisive step toward achieving its net-zero target by 2070. The comprehensive strategy, which seamlessly combines rapid renewable energy expansion, strategic grid modernization, an accelerated push for transportation electrification, innovative financing models, and the establishment of sophisticated market-based mechanisms, unequivocally demonstrates the country's profound commitment to addressing climate change while simultaneously ensuring continued robust economic growth and development.

By resolutely pursuing these ambitious targets and implementing a holistic strategy, India is positioning itself as a global leader in the clean energy transition. This profound transformation is not merely an environmental imperative but also a significant economic opportunity, expected to create millions of green jobs across various sectors, drive unprecedented technological innovation, and attract substantial domestic and international investment. However, the ultimate success of this monumental transition will fundamentally depend on India's ability to effectively navigate and overcome the persistent challenges related to mobilizing adequate financing, overcoming infrastructure bottlenecks, ensuring equitable access to advanced clean technologies, and achieving seamless policy integration and implementation.

As India continues to refine, adapt, and implement these dynamic strategies, the country's unique experience will undoubtedly provide invaluable lessons and a compelling model for other developing nations striving to balance urgent climate action with the imperative of sustainable economic development goals in the 21st century.

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