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Green Energy Financing and Investment Laws in India: A Critical Analysis

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ABSTRACT

In the context of global climate change, the transitions to green energy resources have gained a significant traction worldwide including India, as the growth of energy sector is closely connected to overall development, economic stability, and environmental sustainability of a nation. Heavy fossil fuel exploitation causes Greenhouse Gas emissions and air pollution, necessitating a shift to renewable and clean energy sources. Sustainable development requires financing and thus, the green energy financing and investment has become the essential need of the hour to reduce carbon emissions and address environmental concerns. Green energy financing and investment provide resources for projects promoting renewable energy, transitioning from fossil fuels to sustainable alternatives. Green Energy Financing includes R&D funding, project development, equipment procurement, provision of loans, grants, subsidies, and financial incentives. Green Energy Investment involves allocating financial resources for returns from renewable projects, through direct investment, equity stakes, or financial instruments like green bonds or funds. India's transition to green energy faces challenges due to rising electricity demand, economic growth, and population expansion. Renewable energy growth is significant but insufficient. Prioritizing energy conservation, efficiency, and supportive regulations is crucial for sustainable energy security and reduced fossil fuel dependence.

This study analyses legal, financial, and regulatory aspects of green energy financing in India, aiming to promote a low-carbon economy and sustainable development while evaluating judicial impacts on green energy investments.

Keywords*: Green Energy, Renewable Energy, Green Financing, Green Investment, Sustainable Development.*

I. INTRODUCTION

In the changing global scenario of the 21st century, the energy sector in an economy poses an important role for the development of the economy. It is very essential to have consistent inexpensive and proficient energy resources and facilities as the growth of energy sector is closely connected to overall development, economic stability and development, and

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environmental sustainability of a nation. As all the economic activities from production to end use of goods and services fully depends on availability of adequate energy resources the energy sector is one of the prime fundamental components for the economic growth in this 21st century. For generation of energy, fossil fuels which are found in Earth's crust, are exploited heavily and as such Greenhouse Gasses (GHGs) and air pollutant emissions are causing alarming concern globally. Due to havoc air pollution and global warming, the need for adaptation of renewable and clean energy sources becomes more urgent. For sustainable development, financing is required and thus, the green energy financing and investment has become the essential need of the hour. The transitions to green energy resources have gained significant traction worldwide including India, as a response to environmental concern and the need to reduce carbon emissions.

Green energy financing and investment reports to the available provisions of financial resources and capital for projects and initiatives that promote the development, deployment, and adoption of renewable energy sources and technologies that aimed at supporting the transition from possible fuel-based energy systems to sustainable and environmentally friendly alternatives. Green energy financing involves various mechanisms and strategies to provide financial support for renewable energy projects such as funding for research and development, project development and construction, equipment procurement, provision of loans, grants, subsidies, and other financial incentives to facilitate the implementation of green energy initiatives. Green energy investment, on the other hand, involves allocating financial resources with the expectation of generating returns from renewable energy projects. Investors can participate in the renewable energy sector by investing directly in the projects acquiring equity stakes in renewable energy companies, or investing in financial instruments such as green bonds or renewable energy funds.

To promote and implement the green energy financing and investment, a nation shall first introduce policies, laws, regulations to foster the Green Energy Technologies for sustainable development. India being a second largest country by population, and a fastest growing developing country, consumes huge energy that are mostly generated from fossils-based energy resources. To advocate the sustainable development of the environment, India in footing with the world, has also came up with various policies, legislation, regulations, legal framework, and mechanism to promote the green energy financing and investment in India. India has framed these policies based on various international conferences, seminars, summits, etc. on green energy financing and investment. Government of India has established the Ministry of New and Renewable Energy (MNRE) to Govern and monitor the green energy sector in India. The

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Government of India has also specifically established various corporations and agencies to foster the renewable energy sector in India such as Indian Renewable Energy Development Agency (IREDA), Solar Energy Corporation of India (SECI) etc. To implement the Green Energy Financing and Investment requires involvement of multiple legislations on financing and investment such as, Investment and Securities Act, RBI Act, Electricity Act, FDI[2] & FII policies, Securities Contract (Regulation) Act, 1956, Environment Protection Act etc. These legislations deal and govern the financial and investment policies, as a whole, including the Green Energy Financing and Investment as well. The Government of India has launched National Action Plan on Climate Change (NAPCC) in 2008 with eight (8) National Missions with aims at fulfilling developmental objectives including reduction of emission intensity of the economy, improvement of energy efficiency etc.

As part of its best effort, India ratified the Paris Agreement with an ambitious Nationally Determined Contribution (NDC).[3] India's third biennial update report submitted to the UNFCCC in 2021 reports a reduction in emission intensity between 2005 to 2016 to be 24 per cent. According to the Central Electricity Authority, India's share of non-fossil fuel sources in installed capacity of electricity generation increased from 30.5 per cent in March 2015 to 40.2 per cent at the end of December 2021.[4]

The Hon'ble Prime Minister of India in Glasgow in November 2021 further enhanced the ambition on addressing climate. These include five nectar elements (*Panchamrit*) of India's climate action: (1) Reach 500GW non-fossil energy capacity by 2030; (2) 50 per cent of its energy requirements from renewable energy by 2030; (3) Reduction of total projected carbon emissions by one billion tonnes from now to 2030; (4) Reduction of the carbon intensity of the economy by 45 per cent by 2030, over 2005 levels; (5) Achieving the target of net zero emissions by 2070. India now stands committed to reduce Emissions Intensity of its GDP by 45 percent by 2030, from 2005 level and achieve about 50 percent cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030.[5]

However, as per the report by McKinsey, building a Green Energy Portfolio will be an Expensive Affair for India requiring an estimated 7.2 trillion dollars of green energy investment

[2] PIB Delhi, India's renewable energy sector has received FDI equity investment of $ 6.1 billion during April 2020 – September 2023: Union Minister for Power and New & Renewable Energy, PIB, Dec. 19, 2023, 5:30PM https://pib.gov.in/PressReleasePage.aspx?PRID=1988293

[3] The Paris Agreement, often referred to as the Paris Climate Accords, is an international treaty on Climate Change, adopted in 2015. The Agreement covers climate change mitigation, adaptation, and finance.

[4] Framework for Sovereign Green Bonds, mof, Govt. of Ind., 2891146/2022/Finance Unit, 2022 https://dea.gov.in/sites/default/files/Framework%20for%20Sovereign%20Green%20Bonds.pdf

[5] *Id.*

until 2050.[6] The investment will be for the procurement of land to meet requirements for solar, wind and green hydrogen capacities. The Road to a clean and green transition is not smooth for India. India has faced challenges due to the Pandemic and global disruptions in energy and technology supply chains. The country also faced challenges such as the procurement of cheap solar equipment and uncertainties over grid infrastructures development. However, the Government of India is taking effective steps to eradicate such embargos. To achieve the target of 'net zero emissions by 2070'[7], Government of India has also to reform the Policy over Green Energy Financing and Investment, such as, reverse auction, lowering the corporate tax rates for developers, mandates for utilities to procure renewable energy.

II. OVERVIEW OF GREEN ENERGY IN INDIA

Not every energy is made equally. Furthermore, everyone of us should be aware of the source of our energy and how it affects the environment as regular consumers. Thankfully, we now possess the ability to not only determine the source of our energy but also, in many instances, to select it.

(A) Definitions and Types of Green Energy:

Any form of energy produced from renewable natural resources, including sunshine, wind, or water, rain, tides, waves, and geothermal heat is referred to as green energy. Though there are various distinctions between green and renewable energy, it often originates from renewable energy sources.

Unlike conventional fossil fuels, green energy sources produce little or no greenhouse gas emissions, making them environmentally friendly alternatives. The primary types of green energy include solar power, wind power, hydropower, biomass, and geothermal energy. Each of these energy sources has distinct advantages and technological requirements that contribute to their integration into the energy mix.

Renewable energy, often known as clean energy, originates from naturally occurring processes or sources that are continuously renewed. For instance, even if their availability varies with the seasons and weather, sunshine and wind continue to shine and blow.

Although harnessing the force of nature is frequently associated with new technology, it has long been utilised for a variety of purposes, including lighting, warmth, and transportation.

[6] Rajat Gupta, et.al., Decarbonising India: Charting a pathway for sustainable growth, (McKinsey Sustainability 2022)

[7] PIB Delhi, Net zero emissions target, PIB, Aug. 03, 2023, 5:04PM https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1945472

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Wind has propelled grain-grinding windmills and seafaring vessels. The sun has warmed the day and assisted in starting flames that have lasted into the evening. However, for the last 500 years or so, people have become more and more reliant on dirtier, more affordable energy sources like fracked gas and coal. [8]

(B) Current Status of Green Energy Production in India:

India has made significant strides in green energy production over the past decade, driven by ambitious government targets and supportive policies. As of April 2024, India's installed renewable energy capacity, including large hydropower, stands at approximately 191.67 GW[9], with solar and wind energy accounting for the largest shares. Solar power has seen exponential growth, particularly through large-scale solar parks and rooftop solar installations. Wind energy, predominantly concentrated in states like Tamil Nadu, Gujarat, and Maharashtra, continues to expand with new projects and technological advancements.

Hydropower remains a crucial component of India's renewable energy portfolio, contributing significantly to the overall capacity. Biomass and biogas projects are also gaining traction, especially in rural areas where they provide decentralized energy solutions. Geothermal energy, although in the nascent stages of development, holds potential for future exploration and utilization.

Currently, India has the following installed capacity of Renewable Energy Sources[10]:

- Wind power: 46.16 GW
- Solar Power: 82.63 GW
- Biomass/Co-generation: 10.35 GW
- Small Hydro Power: 5 GW
- Waste To Energy: 0.59 GW
- Large Hydro: 46.92 GW

a. Key players and stakeholders in the green energy sector:

The green energy sector in India involves a diverse range of stakeholders, including government bodies, private companies, financial institutions, and international organizations. Key government entities include the Ministry of New and Renewable Energy (MNRE), which

[8] Lora Shinn, Renewable Energy: The Clean Facts, *NRDC*, (June 01, 2022), https://www.nrdc.org/stories/renewable-energy-clean-facts#sec-whatis
[9] Invest India, https://www.investindia.gov.in/sector/renewable-energy (last visited on June 15, 2024)
[10] *Id.*

formulates policies and oversees renewable energy programs, and the Solar Energy Corporation of India (SECI)[11], responsible for implementing solar projects and schemes.

Private sector participation is robust, with leading companies such as Tata Power Renewable Energy Limited[12], Adani Green Energy Limited[13], and ReNew Power Ventures[14] playing pivotal roles in project development and deployment. Financial institutions, both domestic and international, are increasingly investing in renewable energy projects, providing essential capital and financial instruments.

International organizations, including the International Renewable Energy Agency (IRENA)[15] and the World Bank, collaborate with the Indian government and private sector to promote green energy initiatives and facilitate technology transfer and capacity building.

b. Government initiatives and policies promoting green energy:

The Indian government has implemented a range of initiatives and policies to accelerate the adoption of green energy. The National Action Plan on Climate Change (NAPCC) outlines the strategic framework for addressing climate change, with missions dedicated to solar energy, enhanced energy efficiency, and sustainable agriculture, among others.[16]

The National Solar Mission, launched in 2010, aims to establish India as a global leader in solar energy by setting ambitious capacity targets and providing incentives such as subsidies, tax benefits, and viability gap funding. Similarly, the National Wind Energy Mission focuses on harnessing India's wind energy potential through supportive policies and regulatory frameworks.

State governments also play a crucial role in promoting renewable energy by offering state-specific incentives, feed-in tariffs, and policy frameworks. For example, Gujarat's Solar Power Policy and Tamil Nadu's Wind Energy Policy have been instrumental in driving regional growth in these sectors.

Furthermore, the introduction of Renewable Purchase Obligations (RPOs) mandates that electricity distribution companies procure a certain percentage of their power from renewable sources, thereby creating a market for green energy. The development of Green Energy Corridors aims to strengthen the transmission infrastructure for renewable energy, facilitating

[11] Solar Energy Corporation of India, https://www.seci.co.in/ (last visited on Sep. 06, 2024)
[12] Tata Power, https://www.tatapower.com/renewables (last visited on Sep. 06, 2024)
[13] Adani Renewables, https://www.adanigreenenergy.com/ (last visited on Sep. 06, 2024)
[14] ReNew, https://www.renew.com/ (last visited on Sep. 06, 2024)
[15] IRENA, https://www.irena.org/ (last visited on Sep. 06, 2024)
[16] Prime Minister's Council on Climate Change, National Action Plan on Climate Change, Archive PMO (Jun. 24, 2024, 11:05AM) https://archivepmo.nic.in/drmanmohansingh/climate_change_english.pdf

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grid integration and ensuring stable power supply.

Through these concerted efforts, India is well on its way to achieving its renewable energy targets, contributing to global climate change mitigation efforts while fostering sustainable economic growth.

(C) Legal Framework for Green Energy Financing:

India, with its burgeoning population and growing energy needs, has set ambitious targets for renewable energy integration. To achieve these goals, a robust financial ecosystem is crucial. India's legal framework for green energy financing is shaped by a comprehensive set of laws, policies, and regulations aimed at promoting renewable energy development and investment. These legal instruments provide the necessary support for the establishment, operation, and financing of green energy projects, ensuring that the country's renewable energy goals are met effectively. This chapter delves into the legal framework that governs green energy financing in India, analysing the key enactments, policies, and regulatory bodies that shape this landscape.

a. The Energy Conservation Act, 2001 (EC Act 2001):

Predating the Electricity Act of 2003, The Energy Conservation Act, 2001 (EC Act 2001) laid the groundwork for promoting energy efficiency and indirectly contributed to green energy financing. The Act established the Bureau of Energy Efficiency (BEE), which plays a pivotal role in formulating policies and programs to enhance energy conservation and efficiency. While the primary focus of the Act is on energy efficiency, it indirectly supports green energy financing by promoting the adoption of energy-efficient technologies and practices, which complement renewable energy initiatives.

b. Electricity Act, 2003:

The Electricity Act, 2003, serves as the cornerstone of India's energy legislation, providing a robust legal framework for the generation, transmission, distribution, and trading of electricity. It lays the foundation for open access, paving the way for green energy producers to sell electricity directly to consumers. The Act mandates the establishment of Renewable Purchase Obligations (RPOs)[17] on electricity distribution companies (DISCOMs) to procure a specific percentage of their electricity from renewable sources[18] (EC Act 2003, Section 86). This provision incentivizes the development of renewable energy projects by guaranteeing a market for their electricity.

[17] Order, F. No. 09/13/2021-RCM, MoP, GOI, https://powermin.gov.in/sites/default/files/Renewable_Purchase_Obligation_and_Energy_Storage_Obligation_Trajectory_till_2029_30.pdf (Jul. 22, 2022)
[18] Electricity Act, 2003, § 86, No. 36, Act of Parliament, 2003 (India).

c. National Action Plan on Climate Change (NAPCC):

The National Action Plan on Climate Change (NAPCC) outlines India's strategy for addressing climate change, with a strong emphasis on renewable energy. The NAPCC comprises eight national missions, including the National Solar Mission and the National Mission for Enhanced Energy Efficiency. These missions set ambitious targets for renewable energy capacity and provide a framework for policy and regulatory measures to achieve these goals. The NAPCC's integrated approach ensures that renewable energy development is aligned with broader climate change mitigation and adaptation strategies.

d. National Solar Mission and Other Renewable Energy Missions:

The Government of India has launched several ambitious missions to promote renewable energy adoption. The National Solar Mission, launched in 2010, is a flagship initiative under the NAPCC, aiming to establish India as a global leader in solar energy. The mission sets a target of 100 GW of solar capacity out of 175 GW of energy through renewable sources by 2022, with further expansion planned for subsequent years. The mission's objectives include promoting research and development, reducing the cost of solar power generation, and increasing domestic manufacturing capabilities.[19]

The National Hydrogen Mission[20], announced in 2021, aims to make India a global hub for green hydrogen production and utilization. Green hydrogen, produced through electrolysis powered by renewable energy sources like solar and wind, has the potential to significantly reduce carbon emissions across various sectors, including transportation, industry, and power generation. The legal and regulatory landscape for green hydrogen is still evolving, with policies focusing on providing incentives for research and development, subsidies for production and infrastructure development, and establishing standards and certifications for green hydrogen. The integration of green hydrogen into the broader energy policy framework underscores India's commitment to diversifying its energy mix and reducing its carbon footprint.

Beyond solar, India has initiated other renewable energy missions, including:

- National Mission on Wind Power[21]
- National Mission on Biogas[22]

[19] *Supra* note 16.
[20] National Green Hydrogen Mission, MNRE, https://mnre.gov.in/en/national-green-hydrogen-mission/ (Jun. 05, 2024, 11:15AM)
[21] Wind Overview, MNRE, https://mnre.gov.in/en/wind-overview/ (Jun. 05, 2024, 11:05AM)
[22] Biogas Programme, MNRE, https://mnre.gov.in/en/bio-gas/ (Jun. 05, 2024, 11:20AM)

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- National Mission on Enhanced Energy Efficiency[23]

These missions provide a comprehensive framework for promoting renewable energy across various technologies, and financial incentives, fostering a diversified and robust green energy sector in India.

e. The Tariff Policy, 2006:

The Tariff Policy, 2006, issued by the Ministry of Power (MoP), elaborates on the mechanism for determining tariffs for renewable energy sources. It provides for long-term Power Purchase Agreements (PPAs) between renewable energy generators and DISCOMs, offering financial stability to green energy projects. Additionally, the policy allows for viability gap funding (VGF) for specific renewable energy technologies to bridge the gap between the cost of renewable energy generation and the prevailing market tariffs.[24]

f. The Environment (Protection) Act, 1986:

The Environment (Protection) Act, 1986 (EPA 1986), is a crucial piece of legislation that ensures environmental sustainability in green energy projects. It empowers the central government to establish environmental regulations for various industries, including the power sector.[25] These regulations set standards for emissions, waste disposal, and other environmental considerations, ensuring that green energy development adheres to environmentally sound practices.

g. State-Level Policies and Incentives:

In addition to national policies, state governments play a crucial role in promoting renewable energy through state-specific policies and incentives. Various states have implemented policies tailored to their unique renewable energy potential and market conditions. For example, Gujarat's Solar Power Policy offers attractive tariffs and subsidies for solar power projects, while Tamil Nadu's Wind Energy Policy provides fiscal incentives and streamlined regulatory processes for wind energy developers.

State-level policies also include net metering regulations, which allow consumers to generate their own renewable energy and sell excess power back to the grid. These policies encourage distributed generation and enhance the financial viability of small-scale renewable energy projects.

[23] National Mission for Enhanced Energy Efficiency, Bureau of Energy Efficiency, https://beeindia.gov.in/en/programmes/nmeee (Jun. 05, 2024, 11:30AM)
[24] Tariff Policy, 2006, GOI (Ministry of Power, 2006)
[25] The Environment (Protection) Act, 1986, §3&6, No.29, Acts of Parliament, 1986 (India)

h. Regulatory Institutions:

Several regulatory institutions play a vital role in facilitating green energy financing in India.

- Central Electricity Regulatory Commission (CERC)[26]: The CERC regulates the electricity sector, including tariff determination for renewable energy sources. It approves PPAs between generators and DISCOMs, ensuring fair pricing and fostering a competitive market for green energy.
- Ministry of New and Renewable Energy (MNRE)[27]: The MNRE is the nodal ministry responsible for promoting and developing renewable energy in India. It formulates policies, incentivizes green energy projects, and facilitates financing mechanisms.
- Institutions like the Indian Renewable Energy Development Agency (IREDA) and the Solar Energy Corporation of India (SECI) play a crucial role in financing and facilitating renewable energy projects. Their involvement has been instrumental in attracting private sector participation.[28]
- State Electricity Regulatory Commissions (SERCs)[29]: SERCs regulate the power sector within their respective states. They approve tariffs for intra-state power purchase and play a crucial role in promoting renewable energy adoption at the state level.

(D) Financial Instruments and Mechanisms:

Financing the transition towards a clean energy future in India necessitates a diverse range of financial instruments and mechanisms. This chapter explores the various tools available to support green energy projects, the role of financial institutions, and investment strategies from both public and private sectors. Additionally, it highlights the importance of international funding and foreign direct investment (FDI), and concludes with real-world examples of successful green energy projects in India.

a. Types of Financial Instruments:

A well-structured financial ecosystem offers a variety of instruments to cater to the diverse needs of green energy projects at different stages of development. Here's an overview of some key instruments:

(a) Debt Financing:

[26] Central Electricity Regulatory Commission, GOI, https://www.cercind.gov.in/ (last visited on May 31, 2024).
[27] Ministry of New and Renewable Energy, GOI, https://mnre.gov.in/ (last visited on May 31, 2024).
[28] Financing Norms, IREDA, https://www.ireda.in/detailed-financing-norms (Jun. 15, 2024, 8:30AM)
[29] SERC Links, Central Electricity Regulatory Commission, GOI, (May 31, 2024, 07:30PM) https://www.cercind.gov.in/serc.html

- Commercial Loans: Banks and financial institutions offer project finance loans with customized repayment structures based on project cash flows. These loans are often secured by project assets, mitigating risk for lenders.
- Green Bonds[30]: These bonds, issued by companies or government entities, specifically raise capital for renewable energy projects. Investors seeking environmental impact alongside financial returns are attracted to green bonds.[31]

(b) Equity Financing:

- Venture Capital (VC): VC firms provide early-stage funding for innovative green energy technologies with high growth potential. This helps bridge the gap between initial investment needs and future revenue generation.[32]
- Private Equity (PE): PE firms invest in established green energy companies with a proven track record. Their involvement can lead to operational improvements and facilitate expansion plans.

(c) Government Incentives:

- Subsidies: The Indian government offers various subsidies to make renewable energy projects more financially viable. These can be upfront capital subsidies or feed-in tariffs that guarantee a fixed price for electricity generated.
- Grants: Government grants support research and development (R&D) activities in the clean energy sector, fostering innovation and technological advancements.

b. Role of Financial Institutions and Banks:

Financial institutions and banks, both domestic and international, play a critical role in channelling funds towards green energy projects. Institutions such as the State Bank of India (SBI), Indian Renewable Energy Development Agency (IREDA), and private sector banks have established dedicated green energy financing divisions. These institutions offer a range of financial products and services, including project financing, working capital loans, and risk mitigation instruments They can:

- Develop specialized green financing products: Tailored loan products with flexible

[30] Dr. Satyendra Kumar, et. al., Green Bonds - Role and scope in India's financial and fiscal landscape, IJIIBF, 43, 43-56, (Jul-Sep., 2023)
[31] Green Debt Securities, SEBI, https://www.sebi.gov.in/statistics/greenbonds.html (Jul. 03, 2024, 8:45AM)
[32] Matthias van den Heuvel, et. al., The role of venture capital and governments in clean energy: Lessons from the first cleantech bubble, 124, Energy Economics, (2023) https://www.sciencedirect.com/science/article/abs/pii/S0140988323003754 (Jul. 03, 2024, 8:45AM)

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terms and competitive interest rates can incentivize green energy investments.

- Undertake risk assessment and mitigation: Banks with expertise in evaluating green energy projects can effectively assess risks and offer appropriate risk mitigation strategies for lenders.
- Partner with government agencies and multilateral institutions: Collaboration with government and international organizations can unlock additional funding sources and technical expertise for green projects.

International financial institutions, including the World Bank, Asian Development Bank (ADB), and International Finance Corporation (IFC), also provide substantial funding and technical assistance for renewable energy projects in India. Their involvement enhances investor confidence and facilitates the transfer of global best practices.

c. **Public and Private Sector Investment:**

Public Sector Investment: The Indian government plays a crucial role in driving green energy financing through various initiatives:

- Direct investments in renewable energy projects: Public sector undertakings can directly invest in and develop green energy projects, demonstrating commitment to clean energy transition.
- Green Infrastructure Investment Trusts (InvITs): These instruments pool together multiple renewable energy projects, attracting investments from a broader range of public and private institutions.[33]

Private Sector Investment: The private sector is increasingly recognizing the potential of green energy as a viable and profitable investment opportunity. Private companies are actively involved in:

- Developing and operating renewable energy projects: Leading companies across various sectors are investing in renewable energy generation to meet their own energy needs or for commercial purposes.
- Investing in green technology companies: Private equity and venture capital firms are actively seeking opportunities in innovative green technologies with high growth potential.

[33] Green Infrastructure Investment Coalition, Climate Bonds Investment, https://www.climatebonds.net/files/files/-Coalition%209Mar16.pdf (Jul. 15, 2024, 07:25PM)

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d. International Funding and Foreign Direct Investment (FDI):

International funding and foreign direct investment (FDI) are crucial for scaling up India's renewable energy capacity. Global investors are attracted to India's large and growing renewable energy market, supported by stable policy frameworks and high returns on investment. International funding sources include multilateral development banks, bilateral aid agencies, and private investors seeking to diversify their portfolios with sustainable investments.

International Funding: Multilateral institutions like the World Bank, Asian Development Bank (ADB), and Clean Technology Fund (CTF) provide concessional loans and technical assistance to support green energy projects in developing countries.

Foreign Direct Investment (FDI): FDI plays a vital role in bridging the financing gap for green energy projects in India. Foreign investors bring not only capital but also technological expertise and best practices to the Indian renewable energy sector.

e. Case Studies of Successful Green Energy Projects:

Case studies of successful green energy projects in India highlight the effectiveness of the legal and financial frameworks in place. Notable examples include the Rewa Ultra Mega Solar Park[34] in Madhya Pradesh, which has set new benchmarks for low-cost solar power, and the Suzlon Wind Energy project in Gujarat, a testament to the potential of wind energy in India. The recent development of green hydrogen projects, such as the collaboration between Indian Oil Corporation and NTPC Limited for setting up a green hydrogen plant, illustrates the growing interest and investment in this emerging sector.

(E) Investment Laws and Regulations in Green Energy Financing:

Building a robust green energy sector in India hinges on a conducive legal and regulatory framework that fosters investment. This chapter delves into the national perspectives governing foreign direct investment (FDI), the role of international organizations and agreements, and the legal challenges that persist. Additionally, it compares India's approach with global best practices to identify areas for potential improvement.

a. National Perspectives:

- Foreign Direct Investment (FDI) Policies: India has adopted a liberalized FDI regime, allowing up to 100% automatic FDI in most renewable energy segments, including

[34] RUMSL, India, http://rumsl.mp.gov.in/ (last visited on July 01, 2024).

solar, wind, and biomass power[35]. Various tax incentives, such as exemptions on customs duty for certain renewable energy equipment and accelerated depreciation benefits, are provided to encourage foreign investment. This open approach aims to attract foreign capital and technological expertise for green energy development.

- National Regulatory Framework: As outlined in Chapter 2, India's legal framework for green energy financing comprises key enactments like the Electricity Act (2003) and the Tariff Policy (2006). These create a market mechanism for renewable energy by establishing Renewable Purchase Obligations (RPOs) for DISCOMs and ensuring fair tariff determination[36]. Additionally, the Environment (Protection) Act (1986) ensures environmental sustainability in green energy projects.

b. Role of International Organizations and Agreements:

India actively engages with international organizations and participates in agreements that promote green energy financing:

Paris Agreement: India's commitment to the Paris Agreement underlines its long-term vision for transitioning towards a low-carbon economy. This commitment creates a favourable environment for green energy investments, as investors seek opportunities to support climate-friendly solutions.

International Solar Alliance (ISA): India is a co-founder of the ISA, an international organization that works on facilitating increased solar energy adoption globally. The ISA facilitates collaboration on research, technology transfer, and financing mechanisms for solar energy projects. The ISA works towards mobilizing $1 trillion in investments by 2030 to support solar energy projects, provides technical assistance and capacity-building programs to member countries and facilitating the formulation of supportive policies and regulatory frameworks. The ISA enhances India's position as a global leader in solar energy and attracts international investments into the sector.

c. Legal Challenges and Barriers to Investment:

Despite the progress made, some legal and regulatory challenges remain:

- Complex Regulatory Environment: Navigating the maze of regulations surrounding green energy projects can be time-consuming and expensive for developers. Streamlining the approval process and providing greater clarity on regulations could

[35] Department for Promotion of Industry and Internal Trade (DPIIT), Foreign Direct Investment (FDI) Policy, https://dpiit.gov.in/foreign-direct-investment/foreign-direct-investment-policy (last visited on July 31, 2024)
[36] *Supra* note 8.

enhance investor confidence.

- Grid Integration Issues: The challenge of integrating large-scale renewable energy sources with the existing grid infrastructure can lead to project delays and curtailment of renewable energy generation. Investments in grid modernization are crucial to mitigate this challenge.
- DISCOMs' Weak Financial Health: The financial struggles of many DISCOMs can lead to payment delays for renewable energy generators, impacting project cash flow and investor confidence. Addressing DISCOMs' financial health is essential for creating a more predictable and bankable environment for green energy investments[37].

d. Comparison with Global Best Practices:

While India has made significant strides, comparing its approach with global best practices can highlight areas for improvement:

- Streamlined Permitting Processes: Several countries, like Denmark and Germany, have adopted streamlined permitting processes for renewable energy projects, reducing development timelines and project costs[38].
- Auction Design and Risk-Sharing Mechanisms: Well-designed auctions with clear pricing mechanisms and risk-sharing instruments, as seen in some European countries, can attract a wider pool of investors and mitigate project risks[39].
- Long-Term Policy Certainty: Long-term policy commitments from the government, as seen in countries like China, provide investors with greater predictability and encourage long-term investments in renewable energy (World Resources Institute, 2023).

India's legal and regulatory framework for green energy financing offers a promising foundation for attracting investments. However, addressing the existing challenges and drawing inspiration from global best practices can further enhance the attractiveness of the Indian green energy sector for foreign investors. By fostering a transparent, streamlined, and investor-friendly environment, India can accelerate its transition towards a clean and sustainable energy future.

III. CRITICAL ANALYSIS OF EXISTING LAWS

India, presently, going through a phase of transition towards Green Energy. Currently, the

[37] Turning the Tide in Scaling Renewables, KPMG, (Jul. 15, 2024, 09:45PM) https://kpmg.com/xx/en/our-insights/esg/energy-transition/turning-the-tide-in-scaling-renewables.html
[38] Streamlining Permitting for Renewable Energy Projects, SMET, (Jul. 15, 2024, 09:55PM) https://ec.europa.eu/internal_market/smet/projects/renewable-energy/index_en.htm
[39] Rabia Ferroukhi et. al., Renewable Energy Auctions: A Guide to Design (IRENA 2015).

country is making significant economic progress, and at the same time, the developing economy is shifting through excess installed electrical energy. An annual rise in electricity demand, economic expansion, and population growth, all have the potential to put additional strain on the grid. Therefore, increasing installed electrical capacity is essential. India currently has significant obstacles in meeting its energy needs, and the country's existing energy policies are not sustainable.

It is wise to develop all feasible alternatives because conventional energy sources are scarce and insufficient to meet present energy needs. Although there has been a noticeable increase in the deployment of renewable energy since the last decade and the amount of electricity produced from renewable sources has been rising quickly, the numbers at this time are insufficient to address the issues of energy security, dependence on fossil fuels, environmental protection, and social equity.

Energy conservation and efficiency must both be prioritised appropriately. There will be specific actions made to increase the effectiveness of power generation, transmission, and distribution. An environment with supporting rules and regulations is necessary to encourage green growth, as effective legislative frameworks have historically been the main drivers of technology evolution in a nation.

Numerous issues with the current regulatory structure are impeding India's transition to a renewable energy economy. things like: A common Renewable Purchase Obligation target of 5% was set by the CERC in compliance with the NAPCC commencing in 2009–2010 in each state, with a 1% annual increase provided for 10 years, until a target of 15% was met by 2020. While the RPO mechanism's implementation highlighted the country's transition towards the use of renewable energy, the response from the states discouraged the effort, and the mechanism is currently experiencing a number of issues.

Furthermore, the nation does not have a single comprehensive policy statement for renewable energy. As and when necessary, policies have been released to promote the development of particular renewable energy technology. The past-developed goals for the growth of the renewable energy sector do not align with the actions and policies in place now. While the National Action Plan on Climate Change (NAPCC)'s[40] mandatory objective for Renewable Energy generation is insufficiently met by the MNRE's Renewable Energy capacity addition challenges and the capacity addition projected under the Jawaharlal Nehru National Solar

[40] *Supra* note 16

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Mission (JNNSM)[41].

It is surprising that India, which has demonstrably high energy needs and wants to increase the deployment of renewable energy sources, has not yet had a law drafted on the subject of renewable energy. The primary driver of technology changes in the 20th century has always been government initiatives in the form of required laws and policies. In India, there are a few laws that must be followed that are intended to reform the nation's energy industry.

Two significant pieces of legislation that govern the nation's energy sector are the Energy Conservation Act of 2001 and the Electricity Act of 2003. However, as most renewable energy measures are optional, not mandatory, the legislation hasn't effectively promoted green energy expansion. When these rules are put into action and made mandatory by a separate law focusing on renewable energy regulation in India, they will have more teeth. To develop the green energy industry domestically, certain nations, including Germany and Portugal, have already implemented legislation governing renewable energy. China is now a global leader in the deployment of clean energy and hosts the largest percentage of the world's total installed capacity after enacting an obligatory law in 2006 for the regulation of the renewables sector. For the country's overall development, it is essential to pass legislation particularly governing the renewable energy sector.

India, as of today, has no specific and/or comprehensive legal framework in relation to green energy financing and investment. As a result, the accumulation of Green Investors is very difficult with a huge financial target for green energy generation.

IV. CONCLUSION AND SUGGESTIONS

The preceding chapters have explored the legal framework, financial instruments, and investment landscape for green energy financing in India. It is evident that India has made significant strides in facilitating for clean energy adoption. However, challenges remain, and continuous improvement is necessary to achieve India's ambitious renewable energy goals.

(A) Conclusion:

India's burgeoning population and growing energy needs necessitate a swift transition towards clean energy sources. A robust financial ecosystem is critical to support this transition. The legal framework, with enactments like the Electricity Act (2003) and the Tariff Policy (2006), provides a foundation for green energy financing. Additionally, a diverse range of financial

[41] Jawaharlal Nehru National Solar Mission (JNNSM), India Science, Technology and Innovation Portal, (Aug. 6, 2024, 10:30PM) https://www.indiascienceandtechnology.gov.in/st-visions/national-mission/jawaharlal-nehru-national-solar-mission-jnnsm

instruments, including debt financing, equity financing, and government incentives, cater to the needs of green energy projects at various stages. Financial institutions and banks play a vital role in channelling funds and mitigating risks. Both public and private sectors are increasingly recognizing the potential of green energy and are actively involved in financing and developing renewable energy projects. International funding and foreign direct investment (FDI) are also crucial sources of capital and expertise for the Indian green energy sector.

Despite these advancements, challenges persist. Complex regulatory procedures, grid integration issues, and the weak financial health of DISCOMs can hinder green energy projects. Additionally, there is scope for improvement in terms of streamlining permit processes, designing effective auction mechanisms, and providing long-term policy certainty for investors.

(B) Suggestions:

To further accelerate India's green energy transition, the following suggestions merit consideration:

Streamlining Regulatory Processes: Simplifying and expediting the approval process for renewable energy projects can significantly reduce development timelines and project costs.

Addressing Grid Integration Challenges: Investments in grid modernization and energy storage solutions are crucial to ensure seamless integration of large-scale renewable energy sources into the grid.

Strengthening DISCOMs' Financial Health: Measures to improve the financial health of DISCOMs, such as tariff rationalization and debt restructuring, are essential to ensure timely payments to renewable energy generators.

Enhancing Investor Confidence: Providing long-term policy clarity, transparent auction designs with risk-sharing mechanisms, and efficient dispute resolution mechanisms can attract a wider pool of investors and boost investor confidence.

Promoting Innovation and Technology Transfer: Increased government and private sector support for research and development (R&D) in clean energy technologies is essential to drive down costs and enhance the efficiency of renewable energy solutions.

Fostering Capacity Building: Building a skilled workforce with expertise in renewable energy project development, operation, and maintenance is critical for the long-term sustainability of the green energy sector.

By implementing these suggestions and continuously improving the legal, regulatory, and financial ecosystem, India can create a more attractive environment for green energy

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investments. This will not only ensure energy security for the nation but also contribute to mitigating climate change and promoting a cleaner environment for future generations.

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