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## FROM POLICY TO PRACTICE: EXAMINING INDIA'S RENEWABLE ENERGY EFFORTS AND LEGAL FRAMEWORK

*Abhinav Yadav\* & Mumuksha R Vats\**

*[Abstract: This article explores two key aspects of India's renewable energy landscape. The SDGs emphasize universal access to affordable and reliable energy while phasing out traditional energy sources. India's participation in this global movement is showcased through the National Solar Mission and other initiatives aimed at bridging the gap of 207 million people without electricity access. Efforts are being made to ensure sustainable energy services are accessible to all, while collaboration with other countries is fostering progress on a global scale. The article also examines India's renewable energy legislation, specifically focusing on the natural gas sector. It highlights the absence of comprehensive regulations for natural gas and the reliance on older laws, such as the Petroleum Act of 1934 and the Oilfields (Regulation and Development) Act of 1948, which may not adequately address the complexities of the contemporary natural gas industry. Licensing restrictions further contribute to an uncertain environment, particularly concerning liquefied petroleum gas (LPG). Additionally, the article discusses India's shift from longer to shorter contracts in natural gas consumption, indicating a preference for more flexible arrangements. The country has also emerged as a significant player in decentralized liquefied natural gas (LNG) projects, showcasing its potential in this field. To summarise, the article underscores India's commitment to renewable energy development and its pursuit of sustainable energy access for all. It highlights the need for comprehensive legislation and regulatory frameworks to address the unique challenges and complexities of the natural gas sector. By analysing the SDGs and legislative evolutions, this article provides insights into India's ongoing efforts and progress in the renewable energy domain.]*

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*Keywords: Renewable Energy, Sustainable Development Goals, Electricity Act, Solar Alliance etc.*

## I

### **Introduction**

According to the International Energy Agency (IEA), the energy sector accounts for about 70% of global greenhouse gas emissions, with the majority coming from the combustion of fossil fuels. Renewable energy can help to reduce these emissions, with the potential to avoid 60 gigatons of CO<sub>2</sub> emissions by 2050, according to the IEA's Energy Technology Perspectives report.<sup>1</sup> This highlights the immense potential of renewable energy to mitigate climate change by reducing greenhouse gas emissions. Renewable energy can help to reduce greenhouse gas emissions by providing a low-carbon alternative to fossil fuels. For example, wind and solar power generate electricity without producing any carbon emissions. Similarly, hydropower generates electricity by harnessing the energy of moving water, while geothermal power harnesses the heat of the earth's crust. Bioenergy, which includes biofuels and biomass, can also provide a low-carbon alternative to fossil fuels if produced sustainably.

As one of the fastest-growing economies in the world, India faces the dual challenge of meeting its growing energy demands while also protecting the environment. Traditional energy sources such as coal and oil have been the primary drivers of India's economic growth, but they have also contributed to environmental degradation and climate change. In response, the Indian government has implemented policies and regulations to promote the development of renewable energy sources. India has a long history of renewable energy use, dating back to the 1980s when the government established the Indian Renewable Energy Development Agency (IREDA). However, it was not until the

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<sup>1</sup> International Energy Agency, ENERGY TECHNOLOGY PERSPECTIVES 2020 14 (2020).

turn of the 21st century that India began to seriously address the issue of renewable energy through policy and regulation. In 2010, the Indian government launched the National Solar Mission, which aimed to promote the development and use of solar energy in the country. Since then, India has implemented a series of policies and regulations to promote the growth of renewable energy, including the Renewable Energy Act of 2015.

Another important point is that India's power demand is growing rapidly, and it is expected to increase at an average yearly rate of 7.4% over the next 25 years. To cope with this surge in demand, India will have to increase its generation capacity by a significant margin. In fact, the generation capacity will have to be multiplied by five to keep up with the demands of the quickly expanding economy. In 2008, India had 148 GW of generation capacity, which produced 724 billion kWh of energy annually. However, according to the Integrated Energy Policy (IEP) Report of 2006, India's primary energy supply will have to rise three to four times, and its electrical generation will have to increase five to six times, to meet its population's per capita consumption needs and maintain an eight percent growth rate. Therefore, India must significantly increase its generation capacity to meet the energy demands of its growing economy.

## II

### **Sustainable Development Goals and the push to India's Renewable Energy Policies**

The seventh objective of the United Nations' Sustainable Development Goals (SDGs)<sup>2</sup> stresses the importance of granting everyone access to low-cost, reliable, long-lasting, and up-to-date energy while also discontinuing traditional energy sources by 2030. India, which has signed on, has made strides in achieving this aim. Ban Ki-moon, the ex-Secretary-General of the United Nations, believes that

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<sup>2</sup> SUSTAINABLE DEVELOPMENT GOALS available at- <https://sdgs.un.org/goals>. (last visited Feb. 17, 2022)

energy is the "golden thread" that connects economic growth, social justice, and environmental sustainability. People can pursue education, attend universities, acquire jobs, start companies, and reach their maximum potential if they have access to energy at their disposal.<sup>3</sup>

An estimated 25% of all participants in the global energy drive are believed to be from India. Unfortunately, more than 207 million individuals in India still lack access to electricity, according to a 2016 United Nations report. However, the situation has not worsened significantly in recent years. The Indian government's National Solar Mission is making a substantial contribution towards the development of renewable energy, and efforts to electrify rural regions and establish new ultra-mega power projects are advancing the country's objective of ensuring universal access to electricity. India has taken proactive measures to guarantee equal access to sustainable energy services as part of this initiative and has enhanced global collaboration to facilitate progress.

In essence, the passage highlights India's participation in the global move towards renewable energy and the challenge the country still faces in providing universal access to electricity. Despite the high number of people without access to electricity, the government's National Solar Mission and other initiatives are making strides towards bridging the gap. Moreover, India is taking measures to ensure that sustainable energy services are accessible to all, and they are cooperating with other countries to advance the cause globally.

### III

#### **Legislative evolutions in the area of Indian renewable law and policy**

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<sup>3</sup> Department of Public Information, *Secretary-General to Global Development Center: 'Energy is the Golden Thread'*, UNITED NATIONS (Apr 20, 2012) available at- <https://press.un.org/en/2012/sgsm14242.doc.htm>. (last visited Jan. 27, 2022)

India's energy sector lacks comprehensive laws that would specify all forms of energy production. The production, transmission, distribution, and trading of electricity, as well as the collection of tariffs, are all covered by the Electricity Act of 2003. The 2003 Act establishes the appellate tribunal for Electricity (APTEL) as the ultimate authority under the Act, from which the second appeal lies to the Supreme Court, and the electrical regulatory commissions at both the state and federal levels to consider disputes.

In 2019, the Supreme Court issued a clarification regarding its stance on appeal jurisdiction. The court emphasized that it would only exercise its authority to hear appeals in extremely rare cases where there is a significant legal issue at hand. This means that the court's focus is primarily on cases that have substantial implications for the interpretation or application of the law. However, within the renewable energy industry, there exists a legal gap that requires attention. Specifically, this gap pertains to the regulation of wind, solar, and natural gas sources. Unlike other sectors, such as oil or electricity, the natural gas industry lacks comprehensive legislative control. As a result, the responsibility for managing issues related to natural gas falls directly on the executive branch of the federal government.

To address the absence of specific regulations for the natural gas industry, older laws like the Petroleum Act of 1934<sup>4</sup> and the Oilfields (Regulation and Development) Act of 1948<sup>5</sup> serve as the overarching framework. These laws were enacted during a time when natural gas extraction and usage were not as prevalent or significant as they are today. Consequently, they may not adequately address the complexities and unique challenges posed by the contemporary natural gas sector.

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<sup>4</sup> The Petroleum Act, 1934.

<sup>5</sup> The Oilfields (Regulation and Development) Act, 1948.

One particular legal complexity lies in the regulation of liquefied petroleum gas (LPG). Currently, LPG remains unregulated, meaning there are no specific laws governing its production, distribution, or usage. Additionally, there are restrictions imposed through licensing requirements, further complicating the landscape for LPG-related activities.

The absence of comprehensive regulations and the presence of licensing restrictions contribute to an uncertain and potentially problematic environment for the natural gas industry, particularly concerning liquefied petroleum gas. It highlights the need for comprehensive legislation and regulatory frameworks that are tailored to the evolving energy landscape, taking into account the unique characteristics and challenges of natural gas as an energy source.

The licensing and import of liquefied natural gas (LNG) have proven to be ineffective strategies in the Indian economy. Furthermore, there is a lack of clear rules and regulations regarding the use of alternative sources of energy up until a specific date. However, India has implemented a fully automated process for foreign direct investment (FDI) in both conventional and renewable electricity sectors. The regulations set by the central regulatory Commission in 2010<sup>6</sup> state that FDI in power exchanges is limited to 49% through the automated route.

In terms of natural gas and LNG consumption, India has witnessed a significant shift from longer contracts to shorter ones. This indicates a preference for more flexible arrangements. Notably, in the years 2018-2019, India showcased great potential for decentralized LNG projects, establishing itself as a prominent player in this field.

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<sup>6</sup> The Hindu Bureau, *FDI in Power Exchanges: Market not mature to attract foreign players, says industry*, THE HINDU (Nov 7, 2017) available at <https://www.thehindubusinessline.com/markets/FDI-in-Power-Exchanges-Market-not-mature-to-attract-foreign-players-says-industry/article20502554.ece>. (last visited Feb. 15, 2022)

The National Electricity Policy of 2005 brought about a significant reform in the unregulated energy market, aiming to effectively manage energy resources.<sup>7</sup> This policy, also known as NEP 2005, introduced an institutional arrangement to achieve multiple goals. Firstly, it focused on promoting inclusion by ensuring equitable distribution and accessibility of electricity to all sections of society. Additionally, it aimed to foster economic growth by providing quality power at a fair price, thereby facilitating industrial development and improving the overall standard of living. Furthermore, NEP 2005 recognized the importance of private sector involvement in enhancing capacity and efficiency in the power sector. By encouraging private investment, the policy sought to leverage the expertise and resources of private entities to expand power generation and improve the overall performance of the electricity system.

The current National Electricity Policy of 2021<sup>8</sup> builds upon the foundation laid by the 2005 policy and reflects the practical implementation of its principles. This updated policy takes into account the evolving energy landscape and emphasizes the importance of sustainability in the power sector. It recognizes the need to transition towards cleaner and renewable sources of energy, while also ensuring the reliable supply of electricity.

In line with the government's commitment to improving the energy industry, two schemes have been introduced: the Samadhan Scheme and the Shakthi Scheme. The Samadhan Scheme aims to address the challenges faced by power distribution companies (DISCOMs) by providing them financial assistance and guidance to improve their operational efficiency. This initiative seeks to enhance the financial viability of DISCOMs and promote a more sustainable and reliable power distribution system.

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<sup>7</sup> National Electricity Policy, 2005.

<sup>8</sup> National Electricity Policy, 2021.



On the other hand, the Shakthi Scheme focuses on augmenting power generation capacity through the participation of private players. It encourages private sector investment in coal mining and associated infrastructure, aiming to increase coal production and ensure a steady supply for power generation. By leveraging private sector involvement, the government aims to boost overall capacity and efficiency in the power sector, thereby meeting the growing energy demands of the country.

To summarize it, the National Electricity Policy of 2005 pioneered a reform in the unregulated energy market, and the subsequent National Electricity Policy of 2021 built upon its principles to move towards sustainability. The government's commitment to improving the energy industry is further evident through the implementation of the Samadhan Scheme and Shakthi Scheme, which aim to enhance the efficiency, viability, and capacity of the power sector.

#### IV

##### **Electricity Act and Renewable Energy**

The Electricity Act, 2003 (Electricity Act<sup>9</sup>) is the main piece of law that governs the electrical industry in India, encompassing the production, transmission, distribution, trade, and use of electricity. However, renewable energy is currently not specifically addressed by any laws in India. Despite this, renewable energy falls under the purview of the Electricity Act as it is an integral part of the electrical sector. In terms of administrative control and oversight, the Ministry of Power is responsible for the implementation of the Electricity Act and plays a crucial role in the growth of the nation's electrical industry. On the other hand, the Ministry of New and Renewable Energy acts as the central government body

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<sup>9</sup> The Electricity Act, 2003.

overseeing matters related to the advancement and expansion of renewable energy in India.

The government has taken significant steps to encourage the development of wind and solar energy projects through a generation-based incentive program. This program provides generators with financial rewards for each unit of electricity they supply to the grid during the first ten years of operation. This initiative aims to promote the adoption of renewable energy sources and reduce dependence on traditional forms of energy.

Additionally, the government has introduced accelerated depreciation benefits for commercial and industrial users of solar electricity in India. This means that these users can depreciate their investment in wind and solar energy at a faster rate compared to other fixed assets. This attractive depreciation rate serves as an incentive for businesses to invest in renewable energy projects, as it helps them recover their investment costs more quickly.

Furthermore, regulatory commissions established under the Electricity Act have played a vital role in promoting the use of electricity generated from renewable sources. These commissions have enacted regulations that mandate distribution licensees to purchase a minimum quantity of renewable energy as part of their overall electricity demand. By imposing this requirement, the regulatory commissions ensure a market for renewable energy and provide a reliable source of income for generators. The collective effect of these measures is to create a favorable environment for the growth and widespread adoption of renewable energy in India. The generation-based incentive program, along with accelerated depreciation benefits, incentivizes generators and industrial users to invest in wind and solar projects. Simultaneously, the regulatory regulations requiring the purchase of renewable energy by distribution licensees ensures a stable market demand for renewable electricity.

In order to stimulate private investment in wind and solar energy, many state governments possessing abundant renewable energy resources have implemented specific regulations. These policies offer several advantages that contribute to the growth of renewable energy projects. One of the key benefits is the expedited process of converting land for renewable energy development, allowing for quicker establishment of wind and solar projects. Additionally, these regulations facilitate easier access to land, enabling private investors to set up their renewable energy ventures more conveniently.

Moreover, the policies prioritize the procurement of renewable energy by state distribution licensees, which means that these entities have a preference for purchasing electricity generated from wind and solar sources. This preference creates a more favorable market for renewable energy producers, ensuring a steady demand and potential for higher returns on investment.

Furthermore, the regulations grant preferential allocation of evacuation capacities, which refers to the capacity to transport electricity from the renewable energy projects to the power grid. This allocation ensures that renewable energy producers are provided with the necessary infrastructure and resources to effectively transmit the electricity they generate. As a result, they can reliably deliver their energy to consumers, enhancing the viability of their projects. The designation of wind and solar power plants as "must-run" facilities has played a crucial role in facilitating the significant growth of solar power in India. Unlike traditional power plants, which operate under a two-part tariff system, wind and solar power plants have a single-part tariff. This means that their income is directly tied to their production and transmission capabilities.

One of the benefits of the must-run status is that it safeguards wind and solar plants from unjustified backtracking or curtailment, particularly in situations where there is congestion in the grid infrastructure. By being designated as must-

run facilities, these plants are ensured priority in electricity generation and are less likely to face interruptions. In addition, the Ministry of Power has occasionally provided discounts on interstate transmission system fees for power generated by solar and wind sources through the central grid. This move by the ministry further incentivizes the expansion of renewable energy by reducing the financial burden on solar and wind power producers.

India's electrical industry operates within a highly regulated framework that ensures efficient distribution of electricity throughout the country. This regulatory framework involves various entities, including the Central Electricity Regulatory Commission (CERC) and the State Electricity Regulatory Commissions (SERCs), which are established in accordance with the Electricity Act. The CERC and SERCs hold the responsibility of regulating electricity at the federal and state levels, respectively. These commissions possess the authority to enact laws and regulations, which are crucial for governing the functioning of the electrical industry. Additionally, they play a significant role in adjudicating cases involving conflicts between different stakeholders within the industry.

One of the primary functions of these commissions is to resolve disputes that may arise between electricity generators and distribution licensees or between distribution licensees and customers. By having the power to settle such conflicts, the commissions ensure that any disputes are addressed in a fair and impartial manner.

To further strengthen the regulatory structure, the Appellate Tribunal for Electricity (APTEL) serves as a dedicated body for assessing electricity-related disputes. This independent tribunal handles appeals of orders issued by the central or state electricity commissions. Its establishment allows for an additional layer of review and ensures transparency and accountability within the regulatory process.

The central and state commissions play a crucial role in various aspects of the electricity sector. They carry out a range of duties, including the regulation of electricity sale tariffs both at the central and state levels. Additionally, they govern the procurement of electricity generated from different sources, including renewable sources. These commissions are responsible for arbitrating disputes, overseeing electricity transmission, and issuing licenses. In accordance with the Electricity Act, there are two methods outlined for determining tariffs. The first method involves the national and state commissions setting tariffs based on the different tariff rules they have published. The second method involves establishing tariffs through an open competition process. For the bidding process, the federal government follows standardized bidding guidelines and employs conventional bidding documents.

According to the regulations set forth by the Central Electricity Regulatory Commission (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2017<sup>10</sup>, there exists a framework for determining the pricing structure of renewable energy plants. This regulatory framework serves as a benchmark for the Central Commission in establishing generic prices applicable to renewable energy sources. In line with the aforementioned legislation, the term "renewable energy" pertains to the production of electricity from renewable sources, which meets the quality standards required for grid integration. Notably, the definition of "renewable energy sources" has been extended to encompass a diverse range of options. These include small hydro, wind, solar energy (including its integration with combined cycles), biomass, biofuel cogeneration, as well as the utilization of urban or municipal waste. Furthermore, the Ministry of New and Renewable Energy holds the authority to identify and designate additional sources that qualify as renewable

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<sup>10</sup> Central Electricity Regulatory Commission (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2017, R 12.

energy, thereby broadening the scope of permissible resources within the ambit of this regulatory framework.

In a manner parallel to the Central Electricity Regulatory Commission, the state commissions employ a public hearing process to establish a general tariff. This process relies on established generic criteria or predefined cost components stipulated in the tariff determination regulations. It is worth noting that the power generators hold complete discretion over the determination of these prices and the decision to sell power to a distribution licensee. Moreover, as part of the approval and assent procedure, the power purchase agreements for these projects are presented to the state commission. Following due deliberation, the state commission reviews and approves these agreements. Once authorized, the power generator is granted the right to supply electricity to the designated distribution licensee at the mutually agreed-upon rate.

## V

### **Other Important Developments in Renewable Energy Sector**

According to the concurrent list of the Indian Constitution, laws on electricity can be passed by both the Centre and the States. Therefore, governments at the federal and state levels have been actively working on enabling and facilitative policies to promote renewable energy. One of the key objectives is to ensure rural electrification in the country. To achieve this objective, the Union government introduced the Pradhan Mantri Sahaj Bijli Har Ghar Yojana, also known as "Saubhagya," in 2017. The Saubhagya Yojana aims to provide electricity to every household in rural areas. However, achieving grid electricity in remote villages with challenging accessibility requires additional infrastructure.

To address this issue, the government plans to equip homes in these hard-to-reach regions with solar photovoltaic-based systems. These independent solar

systems will be installed in each household as part of the Saubhagya Yojana. This approach will ensure sustainable electricity supply even in areas where grid connectivity is limited or unreliable.

India's membership in the International Solar Alliance (ISA) is a testament to its recognition of the country's abundant solar energy resources and its commitment to becoming a global leader in solar energy utilization.<sup>11</sup> The Indian government has embarked on a comprehensive strategy to harness this potential by introducing a three-part scheme aimed at achieving rural electrification and improving electricity accessibility throughout the country. One component of this scheme is the Atal Jyoti Yojana (AJAY), which focuses on the widespread installation of solar street lights. Another key initiative is the Pradhan Mantri Kisan Urja Suraksha evamUtthaanMahabhiyan (PM-KUSUM), which aims to provide solar pumps to farmers. These efforts underscore the government's strong dedication to promoting the adoption of solar energy as a viable alternative to traditional sources of power.

With a total installed capacity of 39.25 GW, India ranks fourth globally in terms of wind power capacity.<sup>12</sup>The Indian government is actively promoting the expansion of wind energy as a significant source of power generation in the country. To incentivize private sector investment, the government has implemented a range of fiscal and financial measures. One such measure is the provision of Accelerated Depreciation Benefits, which grants exemptions on customs duty for specific components of wind energy generators. Additionally, the Generation Based Incentive (GBI) program is another avenue through which

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<sup>11</sup> INTERNATIONAL SOLAR ALLIANCE *available at* <https://isolaralliance.org/membership/signatory>. (last visited March 5, 2022)

<sup>12</sup> IBEF, *Energy for sustainable growth*, IBEF Blog (Apr 11, 2022) *available at* <https://www.ibef.org/blogs/energy-for-sustainable-growth#:~:text=India%20has%20the%20fourth%20highest,energy%20capacity%20at%209.8%20GW>.

the government encourages investment in wind power. These initiatives collectively demonstrate the government's commitment to fostering the growth of wind energy and attracting vital private sector participation in this sector.

## VI

### **The involvement of Judiciary**

The transition to renewable energy sources for electricity generation is widely recognized as commendable owing to its positive environmental implications. Nonetheless, it necessitates meticulous planning to ensure the efficacy of sustainable endeavors. In line with this, India, during the Glasgow Climate Summit in 2021, committed to a significant goal of generating 40% of its electricity from renewable sources by the year 2030, with a specific emphasis on solar energy accounting for 60% of the total. Regrettably, the government's oversight in accounting for and devising strategies to manage the consequential electronic waste resulting from this shift to solar energy is an oversight with potential ramifications. Consequently, the ostensibly laudable objective of environmental preservation through the adoption of solar power generation is paradoxically undermined by the concomitant escalation of electronic waste.

Recognizing the pressing nature of the situation and the need for swift action, the National Green Tribunal took decisive measures on February 14, 2022<sup>13</sup>. In response to the burgeoning concern surrounding electronic waste derived from discarded solar panels, the tribunal issued a significant order. This directive mandated the establishment of a specialized Joint Committee, comprising esteemed individuals such as the Secretaries of the Ministries of Environment,

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<sup>13</sup> Editorial, *High Time to formulate a sound solar waste management policy: NGT takes suo motu cognizance*, SSC Online Blog (Jul. 25, 2022) available at <https://www.sconline.com/blog/post/2022/07/25/high-time-to-formulate-a-sound-solar-waste-management-policy-ngt-takes-suo-motu-cognizance/>. (last visited Apr. 10, 2022)



Forestry & Climate Change (MoEF& CC) and New & Renewable Energy (MNRE). Tasked with a critical mission, the committee's primary objective is to meticulously craft a robust and comprehensive strategy. This strategy aims to address the responsible management of electronic waste emanating from the disposal of solar panels. By bringing together expertise from relevant government ministries, the committee seeks to develop an actionable plan that encompasses effective waste management practices, ensuring the environmental integrity of the solar energy transition.

## VI

### Conclusion

The expansion of renewable energy sources in a nation is heavily reliant on factors such as land availability and suitable locations. However, this process poses a significant challenge for the government, as it involves acquiring land and preparing it for power generation from these sources. The successful implementation of renewable energy infrastructure requires a dependable banking system, sufficient funding, and private sector investments due to the high costs and complexity involved.

On the international stage, India demonstrated its commitment to addressing climate change by accepting the Paris Agreement during the 2015 United Nations Climate Change Conference.<sup>14</sup> This agreement requires participating parties to take measures to reduce greenhouse gas emissions. However, it is crucial to have appropriate legislation in place to support the development of renewable energy sources and the subsequent production of electricity. Without the right legal

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<sup>14</sup> *Supra* note 2, SUSTAINABLE DEVELOPMENT GOALS *available at* <https://www.un.org/sustainabledevelopment/blog/2016/10/india-ratifies-paris-climate-pact-at-un-brings-its-entry-into-force-tantalisingly-close/>. (last visited Jan. 29, 2022)

framework, international agreements, private sector funding, and investments may not yield the desired results or have a significant impact.

The federal government introduced the Electricity (Amendment) Bill, 2020 with the goal of promoting the growth of the renewable energy industry. The bill includes several revisions aimed at achieving this objective. One significant provision is the establishment of the Electricity Contract Enforcement Authority. This authority will hold exclusive power to resolve disputes arising from power purchase agreements. Additionally, the bill imposes penalties on distribution licensees who fail to meet their renewable purchase obligations. Moreover, the federal government gains the authority to announce a National Renewable Energy Policy and set a minimum renewable purchase obligation. These provisions collectively work towards advancing the renewable energy sector. It is anticipated that this bill, the draught National Electricity Policy 2021, and other policies will implement the necessary modification to improve energy efficiency in order to satisfy technology improvements and climate change objectives.

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