

A Conceptual Study on Legal and Regulatory and Institutional Framework Regarding Renewable Energy

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Abstract – Law is only juridical science. Each sector must have a legal body overseeing the individual zone's functions and directing it. India being one of the quickest developing economies has the third biggest energy shoppers in the world with an incredible potential to make sustainable power source yet it comes up short on a sound law for Renewable Energy Sector. India has exceptional climatic conditions which bolster sustainable power source creation as well as lift energy security in India. The energy utilization pace is expanding at a more prominent rate in India. About 70% of India's power age limit is from Fossil fuels in this way India is to a great extent subject to fossil fuels to fulfill its energy needs. In spite of the fact that being to a great extent subject to fossil fuels India is currently breaking the generalizations in the energy sector by giving driving force on sustainable power source creation. The demand for power is expanding because of accentuation on economic development, improved way of life and Government duty to give power to all by 2022. By and by, greatest bit of demand is met through conventional energy; in any case, because of environmental change issues, practical improvement, government pledge to lessen the energy force of GDP and inexhaustible power (RE) assets ending up financially accessible everywhere scale has prompted accentuation on advancement of sustainable power source. In this Research Study we learned about the different Drawbacks and Regulatory Frameworks, Policies in regards to Renewable Resources.

Keywords: Renewable Resources, Indian Law, Renewable Energy Sector, Fossil Fuels, etc.

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I. INTRODUCTION

India's point of maintainable advancement in energy sector and foundation of successful energy policies is referenced in the Constitution of India under Article 48-A which states that the nation will endeavor to secure, save and enhance the earth while additionally supporting its forests and wildlife. This article framed the impetus and along these lines India wound up one of the first nations to detail a Renewable Energy program which started in the 1970's. The Commission for Additional Sources of Energy (CASE) made in the year 1981 was India's underlying advance in Renewable innovations and this happened when India understood that sustainable sources like daylight, wind, and biomass can give endless spotless, sheltered and natural amicable energy. India is the main nation to have a selective ministry for sustainable power source sector which is Ministry of New and Renewable Energy (MNRE). MNRE manages all the sustainable power source programs, policies and every one of the activities identified with this sector in

India.¹ At that point the commission was later changed into MNRE in 2006.

India's inexhaustible sector is one of the main sectors in the world. In the year 1987, the Indian Renewable Energy Department Agency was made to subsidize the sustainable power source activities in India and today the MNRE and its associated states energize the sustainable power source activities even in the private sector which has raised the sustainable power source sector. Since the formation of the MNRE India has demonstrated an impressive climb in the yearly development pace of the sustainable power source sector.

At present the common electricity law in India is the Electricity act 2003 and it is said that this act has quickened the pace of India's quest for elective wellsprings of Energy. The section 3 of the Electricity act portrays the National Electricity arrangement and plans which expects to set up a National Electricity Policy, a tax strategy and National Electricity plan that streamlines the utilization of assets including

¹ Ministry of New and Renewable Source of Energy, Government of India, <https://mnre.gov.in/>.

thermal, nuclear, hydro and essentially sustainable. Section 4 of the Electricity Act advances a national approach on stand-alone frameworks for rustic territories fixated on Renewable Energy², notwithstanding section 61(h) which uses Renewable Energy in the age of electricity through tariff regulations.³ Indeed, even section 86(1-e) advocates the age of electricity from sustainable sources so as to interface it with India's network and license the deal to any individual while likewise determining a specific level of India's complete electricity utilization got from RE sources.⁴ The ongoing amendment bill for Electricity Act 2003 has included arrangements for Renewable energy age which will be an incredible advance for the upliftment of the Renewable energy sector of India.

Three years back India has drafted the National Renewable Energy Act 2015 which is yet not actualized as a rule yet it has set out the motivation behind this Act which is "to advance the generation of energy using sustainable power sources as per atmosphere, condition and macroeconomic contemplations so as to lessen reliance on fossil fuels, guarantee security of stock and diminish emanations of CO₂ and other ozone depleting substances. This Act will specifically add to guaranteeing satisfaction of national and international goals on expanding the extent of energy delivered using sustainable power sources."

² Section 4 (National Policy on standalone systems for rural areas and non-conventional energy systems): The Central Government shall, after consultation with the State Governments, prepare and notify a national policy, permitting standalone systems (including those based on renewable sources of energy and other nonconventional sources of energy) for rural areas.

³ Section 61 (Tariff regulations): The Appropriate Commission shall, subject to the provisions of this Act, specify the terms and conditions for the determination of tariff, and in doing so, shall be guided by the following, namely:- (a) the principles and methodologies specified by the Central Commission for determination of the tariff applicable to generating companies and transmission licensees; (b) the generation, transmission, distribution and supply of electricity are conducted on commercial principles; (c) the factors which would encourage competition, efficiency, economical use of the resources, good performance and optimum investments; (d) safeguarding of consumers' interest and at the same time, recovery of the cost of electricity in a reasonable manner; (e) the principles rewarding efficiency in performance; (f) multiyear tariff principles; 1[(g) that the tariff progressively reflects the cost of supply of electricity and also, reduces cross-subsidies in the manner specified by the Appropriate Commission;] (h) the promotion of co-generation and generation of electricity from renewable sources of energy; (i) the National Electricity Policy and tariff policy: Provided that the terms and conditions for determination of tariff under the Electricity (Supply) Act, 1948, the Electricity Regulatory Commission Act, 1998 and the enactments specified in the Schedule as they stood immediately before the appointed date, shall continue to apply for a period of one year or until the terms and conditions for tariff are specified under this section, whichever is earlier.

⁴ Section 86. (Functions of State Commission): --- (1) The State Commission shall discharge the following functions, namely: (e) promote co-generation and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity to any person, and also specify, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licensee.

Sustainable power source is at the focal point of the change to a less carbon-concentrated and increasingly sustainable energy framework. Renewables have developed quickly as of late, joined by sharp cost decreases though the electricity sector remains the brightest spot for renewables. The world is at present not on track to meet the principle energy-related parts of the Sustainable Development Goals (SDGs), concurred by 193 nations in 2015. The IEA's Sustainable Development Scenario (SDS) diagrams a noteworthy change of the worldwide energy framework, indicating how the world can change course to convey a portion of the principle energy-related SDGs at the same time.

II. RENEWABLE ENERGY RESOURCES

Developmental changes in the regulatory and operational atmosphere of conventional electric utilities and the rise of littler producing frameworks, for example, micro turbines have opened new open doors for on location power age by electricity users utilizing sustainable assets. In this unique circumstance, disseminated energy assets (DER) - little power generators commonly situated at users' sites where the energy (both electric and thermal) they produce is utilized - have developed as a promising alternative to meet developing client requirements for electric power with an accentuation on unwavering quality and power quality. The arrangement of DER incorporates generators, energy storage, load control, and, for specific classes of frameworks, propelled power electronic interfaces between the generators and the mass power supplier. This white paper recommends that the huge capability of littler DER to address clients' and utilities' issues can be best caught by arranging these assets into Micro Grids.

2.1 Renewables Types

◆ Wind

An abundant source of sustainable power source, wind power is utilized as a methods for producing electricity. Wind turbines are equipped for bridling the power got from the wind, changing over kinetic energy into mechanical energy. A wellspring of perfect, green sustainable power source, ideal atmosphere conditions means wind energy, which is a profoundly reasonable strategy for electricity generation.

◆ Solar

In some structure, solar power has been around humanity for thousands of years. As an inexhaustible source of free, green energy, technology has discovered a method for saddling the sun's energy by means of solar panels which are utilized either to create electricity (solar photovoltaic) or to deliver warmth to warm water (Solar thermal). A well-known

decision in a developing sustainable power source showcase, solar technology doesn't produce greenhouse gases and is naturally amicable.

◆ **Geothermal**

Geothermal energy originates from the first Greek word —Geo which means sun. Geothermal energy is gotten from the warmth that is radiated by the Earth. Steam energy or boiling water that is produced by the Earth can be utilized to create energy. It is viewed as an inexhaustible source of energy as the water in the Earth is recharged by normal precipitation and the warmth utilized is routinely delivered by the planet.

◆ **Biomass**

Biomass energy is created from natural materials, for example, plants and creatures, however the energy that is delivered in this design is initially given by the sun. For instance, plants retain the sun's energy through a procedure called photosynthesis. This energy is then gone on through the living being that eats the plant, making biomass energy. The most common structures used to produce biomass energy are wood, crops, compost and some refuse. At the point when these substances are scorched, they radiate energy as warmth. For instance, on the off chance that you have a wood fuelled warming, you are producing inexhaustible biomass energy. This isn't the main strategy for producing biomass energy; you can likewise make biomass energy by changing over these substances into methane gases, ethanol and biodiesel fuels which can be made an interpretation of all the more effectively into our present techniques for energy use.

◆ **Biofuels**

Biofuels are a type of sustainable power source got from consuming plant or animal substances, generally called combustion. One of the difficulties to biofuels has been that it isn't effectively moved into a fluid structure which is the essential technique used to fuel most vehicles and homes. Two of the most common procedures that are utilized to create biofuels incorporates: developing crops to deliver ethanol and developing plants that produce biofuel oils. While these strategies are powerful sources of sustainable power source, they are trying to create and keep up on an enormous scale.

◆ **Hydro Power**

Hydro energy is gotten from the development of water. One type of hydro power is produced through the development of water through turbines, for example, water going through turbines in a Dam. Hydro power is viewed as a sustainable power source as the water is persistently spun back through the plant or into nature.

III. LEGAL AND REGULATORY FRAMEWORK REGARDING RENEWABLE ENERGY

India has a quasi-federal constitutional structure where administrative and official powers are outlined between the Center and states. The Seventh Schedule of the Constitution assigns subjects over which the authoritative power is doled out to the Center (List I), states (List II), and concurrently to both (List III). Electricity is a concurrent subject under Entry 38 in List III, thusly, both Center and states can enact on this issue. Matters identifying with interstate transactions are in the Center's area while states are in charge of the intra-state deal, buy, dispersion and supply of electricity. In any case, in practice, the division of power between the state and Center isn't as simplistic. Concurrent jurisdiction keeps the Center from directing the states to make explicit move. This can be seen in the way that the Central Electricity Regulatory Commission (CERC) and the State Electricity Regulatory Commissions (SERCs) work. With regards to sustainable power source, the CERC issued regulations in 2010⁵.

India rose as a key player in the ongoing international atmosphere talks in Paris. On the worldwide stage, India repeated its responsibility towards clean energy and diminishing carbon emissions⁶. India's expanded push on sustainable power source is plot in the 2015 national spending plan, which set a five-overlap increment in sustainable power source focuses to accomplish 175 GW by 2022. This contains 100 GW solar, 60 GW wind, 10 GW biomass and 5 GW little hydropower limit, bolstered by a generous budgetary allotment. The current generation limit is overwhelmed by conventional coal-terminated thermal power (211 GW as of May, 2016, 70% of absolute limit)⁷. State distribution companies (Discoms) are by a wide margin the biggest buyer of electricity, including that from sustainable power sources. Along these lines, the capacity of the Discoms to buy such power lies at the core of the achievement of the national level directional move from conventional to inexhaustible power. Be that as it may, by and by, Discoms are reeling under gigantic obligations and their actions are regularly managed by nearby political factors instead of the accomplishment of operational and specialized effectiveness. Progressing in the

⁵ CERC (Terms and Conditions for recognition and issuance of Renewable Energy Certificate for Renewable Energy Generation) Regulations, 2010 - Section 66, Section 178(1) read with Section 178(2)(y) of the Electricity Act confer power on the CERC to make regulations to promote the development of the power market in a manner specified and guided by the National Electricity Policy-http://www.cercind.gov.in/Regulations/CERC_Regulation_on_Renewable_Energy_Certificates_REC.pdf.

⁶ Justin Worland, "Why No Country Matters More Than India at the Paris Climate Talks," TIME, December 11, 2015, <http://time.com/4144843/india-paris-climate-change/>

⁷ CEA Monthly Report on Installed Capacity," May, 2016, http://www.cea.nic.in/reports/monthly/installedcapacity/2016/installed_capacity-05.pdf

direction of the driven national sustainable power source targets essentially requires a patch up of the electricity distribution sector. Major authoritative amendments and strategy changes have been made and are in progress at the focal level to make an empowering domain for the across the nation development of sustainable power source.

The enactment of the Electricity Act denoted a change in outlook inside the power sector towards an all-around aggressive model, with an accentuation on sustainable power. Section 86(1) (e) of the Electricity Act explicitly included advancement and cogeneration of electricity from sustainable sources of energy and setting of RPO focuses among the functions of SERCs. The Electricity Act likewise empowered the SERCs to indicate the terms and conditions for the assurance of tariffs, and in doing as such, they ought to be guided by "the advancement of co-generation and generation of electricity from sustainable sources of energy"⁸. The Electricity Act meant to make the power distribution sector progressively straightforward and responsible by unbundling the state electricity sheets, bringing about the arrangement of autonomous companies with isolated money related records for the generation, transmission and distribution of power, set up of free regulatory commissions at the state and Central levels and the Appellate Tribunal (APTEL). In any case, issues in the sector endure with the corporatized substances proceeding to work as public endeavors⁹. This illuminates why even 13 years after the enactment of the Electricity Act, Discoms are reeling under a combined obligation of Rs. 4.3 trillion¹⁰. Reasons owing to this obligation incorporate monetarily unviable tariffs, misfortunes emerging from burglary combined with transmission and billing inefficiencies.¹¹ The unfavorable financial state of the Discoms influences their reliability and in this way, further keeps them from raising obligation. For the sustainable power source sector, the financial state of Discoms is especially applicable since Discoms are the greatest offtakers of inexhaustible power. With the enactment of the Electricity Act, sustainable power source discovered more notice in national level policy instruments, for example, the National Electricity Policy (NEP), defined in 2005. The NEP stipulated a dynamic move from conventional sources to sustainable power source. It stated that acquisition of sustainable power by the Discoms should be through aggressive offering. Further, since it would set aside effort for sustainable technology to accomplish lattice equality, the

applicable commission has the power to decide special tariffs for electricity got from sustainable power sources. Before long, the National Tariff Policy (NTP) was discharged in 2006, which pointed "to control" central and state controllers in tariff assurance. The most recent rendition of NTP in 2016 refers to advancement of sustainable power source as a key target of the policy.¹²

In 2008, the National Action Plan on Climate Change (NAPCC) distinguished 8 center national missions going through 2017. One of the missions necessitate that a base sustainable buy standard be set, which is expanded every year till a pre-characterized top is come to. It set focuses of 5% sustainable power source buy for FY 2009-10, with an expansion of 1% in objective every year to arrive at 15% sustainable power source focus by 2020. Aside from the bigger framework of the Electricity Act, policies focusing on explicit sustainable power sources, for example, wind, solar, biomass and smaller than usual hydro are operational at both the central and state level.

IV. INSTITUTIONAL FRAMEWORK OF INDIAN ELECTRICITY SECTOR

Implementing change in the power sector is a perplexing issue because of the variety of institutional stakeholders, both at the state and the national level, and their between se elements. The table underneath gives a diagram of the division of powers at the state and central level in the electricity sector, in light of explicit functions.

Table 2.1 Institutional Framework of Indian Electricity Sector

Function	Central Level	State Level	Private
POLICY	MoP Central Electricity Authority MNRE	Department of Energy (eg. Punjab Energy Development Agency)	
GENERATION	Central sector undertakings (eg. NTPC, NHPC)	State power generation companies (eg. Andhra Pradesh Power Generation Corporation)	Independent power producers (eg. Tata Power) Captive power producers (eg. Steel industry)
REGULATION	CERC	SERC	
DISTRIBUTION		State Discom	Private Discoms (eg. BSES in Delhi)
TRANSMISSION	CTU (Power Grid Corporation of India Ltd.)	State transmission utility (eg. Transmission Corporation of Andhra Pradesh)	Independent transmission service providers (eg. Tata Power)

At the central level, the MNRE is the nodal ministry managing sustainable power source. MNRE's goal is to create and send sustainable power source to expand the energy needs of the nation. MNRE has set up three specific specialized establishments - National Institute of Solar Energy, NIWE and Sardar Swaran Singh National Institute of Renewable Energy. IREDA is a non-banking financial organization working under the MNRE, which gives advances and likewise directs reserves and different activities to advance sustainable power source.

¹² An earlier draft of the NTP amendment mentioned that the state and central regulators be "necessarily" guided by the NTP in the discharge of their functions. The term "necessarily" was removed in the final version of the amendment. 11 Para 4.2.2 of NAPCC.

⁸ Section 61(h) of the Electricity Act.

⁹ Devendra Kodwani, "Institutional Endowments and Electricity Regulation in India," 9, http://regulation.upf.edu/bath06/10_kodwani.pdf

¹⁰ Aparna Iyer, "Discom debt to impact states' spending on development: RBI," Live Mint, April 8, 2016, <http://www.livemint.com/Industry/DgYTFNJUmVlVsaQtWtdEP/Power-reforms-likely-to-pressure-states-budgets-RBI.html>.

¹¹ Utpal Bhaskar, "Renewable Energy-India's Sunrise Sector," Live Mint, March 13, 2015, <http://www.livemint.com/Politics/p17bEaMyU6xy6pMa2MisEO/Renewable-energyIndias-sunrise-sector.html>.

Furthermore, Renewable Energy Corporation of India (recent SECI) is engaged with all portions of sustainable power source and in addition to other things, owning solar power plants, creating and selling power and in different fragments of sustainable power source sector activities, including manufacturing of solar items and materials. The Ministry of Power (MoP) defines the more extensive electricity law framework through the NEP and NTP, alongside amendments to the Electricity Act, which directly affects inexhaustible power acquirement and the general institutional structure for such obtainment. Accordingly, at the Central level, MNRE drives the charge on sustainable power source improvement and sending however depends on the MoP for huge scale policy changes to encourage its destinations. At the state level, there are nodal organizations and energy divisions, which work under the managerial control of state governments. These organizations channel Central-level appropriations, actualize pilot ventures, arrange among other neighborhood level offices and are likewise in charge of the implementation of the Energy Conservation Act, 2001. They likewise devise policies for the advancement of sustainable power source inside the state and regulate its implementation.

Aside from the administrative services and divisions, state and central level controllers assume a critical job in the improvement of the sustainable power source sector. The CERC was set up in 1998 to manage the advancement of electricity markets at the national level and additionally to plan a regulatory framework for the states to pursue. In this way, states set up their SERCs which direct intra-state matters and administer the implementation of different regulations, for example, RPO. The table underneath gives a diagram of the jobs of state and central government offices in policy improvement, guideline and advancement of sustainable power source.¹³

Level	Central Government (MoP/Ministry of Finance)	MNRE	CERC
CENTRAL	Develops national electricity tariff policies, which includes renewable energy	Develops national renewable energy laws	Sets guidelines for feed in tariff design for different renewable energy technologies
	Provides fiscal incentives to promote renewable energy	Sets technical standards for renewable energy	Regulates the regional electricity corporation mechanism
		Conducts resource assessment for renewable energy; supports R&D in renewable energy technologies	Regulates inter-state open access and third party sales
		Promotes effective use of information technology for renewable energy, manages database	
		Reviews renewable energy programs to understand their effectiveness and efficiency	
	State Government	State Nodal Agency	SERC
STATE	Provides fiscal incentives for promoting renewable energy sources within the state	Creates awareness and educates the masses about adoption of renewable energy	Determines RPOs and enforcement mechanism
	Develops state- level renewable energy policy	Allocates renewable energy projects and progress monitors	Sets regulations on intrastate wheeling, open access, and third- party sale
		Conducts resource assessments for various renewable energy sources	Determines feed-in tariff for different renewable energy technologies
		Facilitates clearances and land acquisition	
		Maintains database on renewable energy sources	

V. CONCLUSION

Energy security is one of the significant components for economic development. Energy security guarantees continuous supplies of energy in a moderate cost in all structures at all the times. This idea is very basic for India because of intense demand for energy and low supply from indigenous sources. There is bungle among production and demand of energy. Demand for energy is ending up to an ever increasing extent and supply is corrupting. The globalization has pushed India to embrace economic changes in 1991 driving a quick industrialization and urbanization. Energy turned into a contribution to run enterprises, factories and transport for economic development. The economic development raised the salary development and this pay development advances energy subordinate way of life (autos, climate control systems, vehicles). In this manner, moving conventional energy to business energy, for example, oil and gas become increasingly more inescapable in the present times.

REFERENCES

- Adelaja, S.J. & Hailu, Y.G. (2008). Effects of renewable portfolio standards and other state policies on wind industry development in the US mimeo, Michigan State University.
- Auffhammer, M. & Carson, R.T. (2008). Forecasting the path of China's CO2 emissions using province-level information. *Journal of Environmental Economics and Management* 55 (3), pp. 229–247.
- Kotchena, M.J. & Moore, M.R. (2007). Private provision of environmental public goods: household participation in green-electricity programs. *Journal of Environmental Economics and Management* 53, pp. 1–16.
- Ma, C. & He, L. (2008). From state monopoly to renewable portfolio: restructuring India's electric utility. *Energy Policy* 36 (5), pp. 1697–1711.
- Diamandis, Peter & Kotler, Steven (2012). *Abundance: The Future Is Better Than You Think*. New York: Free Press.

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¹³ Gevorg Sargsyan et al., "Unleashing the Potential of Renewable Energy in India," World Bank, 2010, 37, http://siteresources.worldbank.org/EXTENERGY2/Resources/Unleashing_potential_of_renewables_in_India.pdf.