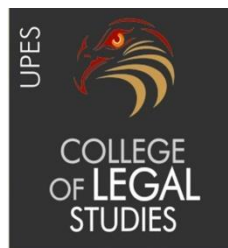


**“DEVELOPMENT OF RENEWABLE ENERGY SECTOR  
IN INDIA:  
ROLE OF REGULATORY FRAMEWORK”**

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*This dissertation is submitted in partial fulfillment of the degree of  
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**College of Legal Studies  
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**Dehradun**

**2017**

**B.A.,LL.B (Hons) 2012-2017**

## CERTIFICATE

This is to certify that the research work entitled “**Development of Renewable Energy Sector in India: Role of Regulatory Framework**” is the work done by Sam C. Mathew under my guidance and supervision for the partial fulfillment of the requirement of B.A., LL.B. (Hons.) degree at College of Legal Studies, University of Petroleum and Energy Studies, Dehradun.

Signature & Name of Supervisor

Designation

Date

## DECLARATION

I declare that the dissertation entitled “**Development of Renewable Energy Sector in India: Role of Regulatory Framework**” is the outcome of my own work conducted under the supervision of Prof. Sam Babu K.C. at College of Legal Studies, University of Petroleum and Energy Studies, Dehradun.

I declare that the dissertation comprises only of my original work and due acknowledgement has been made in the text to all other material used.

Signature & Name of Student

Date

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## LIST OF ABBREVIATION

AHEC	Alternate Hydro Energy Centre
APRDP	Accelerated Power Reforms and Development Programme
AU	Australia
BEE	Bureau of Energy Efficiency
CAG	Comptroller Auditor General
CASE	Commission for Additional Sources of Energy
CEA	Central Electricity Authority
CERC	Central Electricity Regulatory Commission
CERC	Central Electricity Regulatory Commission
CPB	Community Biogas Plant
C-WET	Centre for Wind Energy Technology
DAE	Department of Atomic Energy
DNES	Department of Non-conventional Energy Sources
EIA	Environmental Impact Assessment
FiTs	feed-in tariffs
GoI	Government of India
IBP	Institutional Biogas Plant
IEA	International Energy Association
IEX	Indian Energy Exchange Limited
IPPs	Independent Power Producers
IREDA	Indian Renewable Energy Development Agency
IREP	Integrated Rural Energy Programme
ISA	International Solar Alliance
J&K	Jammu and Kashmir
JCERDC	Joint Clean Energy Research and Development Center
JNNSM	Jawaharlal Nehru National Solar Mission
MNES	Ministry of Non-Conventional Energy Sources
MNRE	Ministry of New and Renewable Energy

MoEFCC	Ministry of Environment, Forest and Climate Change
MOP	Ministry of Power
MoPNG	Ministry of Petroleum and Natural Gas
NAPCC	National Action Plan for Climate Change
NBECL	National Bio Energy Corporation of India
NCEF	National Clean Energy Fund
NEEP	National Energy Efficiency Programme
NISE	National Institute of Solar Energy
NLDC	National Load Dispatch Centre of Power System Corporation Ltd.
NPBD	National Project on Biogas Development
NSPED	National Solar Photovoltaics Energy Development Programme
PACE	U.S.-India Partnership to Advance Clean Energy
PIB	Press Information Bureau
PRC	People's Republic of China
PTC India Ltd.,	Power Trading Corporation of India Limited
PV	Photovoltaics
R & D	Research and Development
RE	Renewable Energy
REC	Renewable Energy Certificate
RECI	Renewable Energy Corporation of India
RGVY	Rajiv Gandhi Grameen Vidyutikaran Yojana
RPO	Renewable Purchase Obligation
SEBs	State electricity boards
SEC	Solar Energy Centre
SEIC	Solar Energy Corporation of India
SERIIUS	Solar Energy Research Institute for India and the United States
SHP	Small Hydropower projects
SSS-NIRE	Sardar Swaran Singh National Institute of Renewable Energy
TTRC	Tradable Tax Rebate Certificates



UK	United Kingdoms
US	United States
VGF	Viability Gap Funding

### CASES REFERRED

- Association of Natural Gas v. Union Of India, (2004) 4 SCC 489.
- Chameli Singh & Ors. v.State of U.P., (1996)2 SCC 549.
- G.Sundarrajan v. Union of India, (2013) 6 SCC 620.
- P. Madhava Rao v. Superintending Engineer And Ors., 2006 SCC OnLine Cal 496.
- T.M.Prakash v. The District Collector, Tiruvannamalai District, 2013(6)CTC 849.

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## PREFACE

India being a fast emerging economy; energy is an important factor for sustained and progressive growth rate of the country. Energy consumption per capita of the country is not very impressive and the divide in consumption between rural and urban areas reflects inequalities in accessibility of energy in India. India since independence has fulfilled its energy demands through conventional sources of energy (coal and petroleum & petroleum products) but with the increasing energy demand and environmental problems attached to conventional sources, the government accorded more emphasises on augmenting renewable energy and increasing its share in the total energy mix of the country.

Energy security, scarcity of conventional energy resources and environmental concerns highlight the importance of renewable energy. The scarce reference of renewable energy under the Electricity Act, 2003 pushes the development of clean energy on the periphery. The haphazard and uneven regulatory environment adds as an additional barrier to the renewable energy sector. Renewable energy needs to be placed in a separate category of energy industry and treatment of this sector along with other energy sectors would fail to bring the desired result.

The federal polity of the country divides legislative subject matters between the centre and the states. 'Electricity' as a legislative subject matter finds its place in the concurrent list of seventh schedule which confers law making authority upon both the Centre and States. Hence, the determination of the policy on the subject oscillates between the different agencies of the Centre and the States.

Numerous legislations are enacted to address various issues of electricity such as energy security, generation and supply. Amidst an array of the central laws and policies, along with different policies pursued by the state governments to promote, generation and use of cleaner source of energy, the position of renewable energy sources requires thorough study. Moreover, the involvement of different ministries such as Ministry of Power, Ministry of New and Renewable Energy, Ministry of Rural Development, Ministry of Urban Development causes lack of coherence in attaining the desirable objective of promotion of renewable energy. As of yet there is no overarching renewable energy

law governing all states. Instead, there are separate initiatives by the central and state governments. Generation, storage and transmission of renewable energy may, perhaps, warrant different approach from the conventional sources of energy. More so, the growing demand and acceptability of renewable energy requires comprehensive approach away from the conventional energy segment. Today, India has significant potential for generation of power from renewable energy sources which will help in meeting the energy demand of the county.

# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

India being a fast emerging economy, energy plays a crucial role for maintaining sustained and progressive growth rate of the country. A deficiency in the energy supply has a direct impact on growth and development of the country and a shortage of energy can hinder the growth of a developing nation such as India. India since independence has fulfilled its energy needs through conventional sources of energy (i.e., coal and petroleum & petroleum products), but the current energy demand (which is increasing at an increasing rate) and problems related to conventional energy sources (pollution and environmental degradation) call for an energy policy which emphasises more on sustainable development relying upon renewable energy resources and proper utilisation of available energy resources rather than depending upon conventional sources of energy.

Energy consumption per capita of the county is not very impressive<sup>1</sup> and the divide in consumption between rural and urban areas reflects inequalities in accessibility of energy in India.<sup>2</sup> In order to be energy secure<sup>3</sup> India need to ensure that energy is accessible to all its citizens. Enhancement of energy security demands an appropriate choice not just of technologies and carriers, but also of institutional structures and delivery systems that ensure access to even the poorest sections of the population.<sup>4</sup>

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<sup>1</sup> India Energy Outlook, IEA 19,141 (2015),

[http://www.worldenergyoutlook.org/media/weowebiste/2015/IndiaEnergyOutlook\\_WEO2015.pdf](http://www.worldenergyoutlook.org/media/weowebiste/2015/IndiaEnergyOutlook_WEO2015.pdf) - research shows that energy consumption per capita of India is one-third of the global average and in spite of new policies by the government, it will remain at 60% of the global average even in 2040.

<sup>2</sup> Ibid. at 19 – around 240 million people don't have access to electricity.

<sup>3</sup> Energy Security, IEA, <http://www.iea.org/topics/energysecurity/> (last visited 27 Dec., 2016) - The IEA defines **energy security** as the uninterrupted availability of energy sources at an affordable price. Energy security has many aspects: long-term energy security mainly deals with timely investments to supply energy in line with economic developments and environmental needs. On the other hand, short-term energy security focuses on the ability of the energy system to react promptly to sudden changes in the supply-demand balance.

<sup>4</sup>Rahul Pandey, *How Can India Achieve Energy Security?*, Vol. 41 No. 4 Econ Polit Wkly. 303, 303-306 (Jan. 28 - Feb. 3, 2006), <http://www.jstor.org/stable/4417723>.

It is not only the scarcity of energy but also the presence of unclean source of energy which raises concern about energy sector. Greenhouse-gas emissions from the energy sector represent roughly two-thirds of all anthropogenic greenhouse-gas emissions and CO<sub>2</sub> emissions from the sector have risen over the past century to even higher levels.<sup>5</sup> India due to exploitation of natural resources to fulfil its energy demands, has become one of the largest emitter of carbon dioxide<sup>6</sup> and if traditional path (increase in emission with the increase in standard of living) is continued it will have an appreciable adverse effect on environment and ecology of the country. India being a ratifying nation to the Rio Convention is duty bound to take steps toward reduction of emission from the energy sector.<sup>7</sup>

Traditionally India's energy mix has always been dominated by conventional energy sources with little reliance on other alternative sources<sup>8</sup>, but with the increasing demand for energy and environmental degradation attached to conventional sources, the government accorded more emphasises on augmenting renewable energy and increasing its share in the total energy mix of the country.<sup>9</sup>

The installed capacity of Power Stations in India as of January, 2017 is 314642.32 MW of power. The Energy mix of the country is spread across various sources with approximately 60% (188487.88 MW) from coal, 14% (44189 MW) from hydro, 2%

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<sup>5</sup>*Energy and Climate Change*, IEA 20 (2015), <https://www.iea.org/publications/freepublications/publication/WEO2015SpecialReportonEnergyandClimateChange.pdf>.

<sup>6</sup> *Low Carbon Economy Index 2015*, PwC (2015), <http://www.pwc.co.uk/sustainability> - India saw the highest rate of emissions growth over the year at 8.2% and contributed the most to the increase in global emissions in 2014.

<sup>7</sup> UN Conference on Environment & Development Rio de Janeiro, Brazil, art. 9.11, June 1992, <http://www.un.org/esa/sustdev/agenda21.htm> - The basic and ultimate objective of this programme area is to reduce adverse effects on the atmosphere from the energy sector by promoting policies or programmes, as appropriate, to increase the contribution of environmentally sound and cost-effective energy systems, particularly new and renewable ones, through less polluting and more efficient energy production, transmission, distribution and use. This objective should reflect the need for equity, adequate energy supplies and increasing energy consumption in developing countries, and should take into consideration the situations of countries that are highly dependent on income generated from the production, processing and export, and/or consumption of fossil fuels and associated energy-intensive products and/or the use of fossil fuels for which countries have serious difficulties in switching to alternatives, and the situations of countries highly vulnerable to adverse effects of climate change.

<sup>8</sup> See Planning Commission Report (2010-11), Planning Commission of India 133 (2010-2011), <http://planningcommission.gov.in/hackathon/Energy.pdf> - The Table 14.4 clearly shows that until 2007 India was dependent upon conventional sources of energy for its energy needs and renewable energy sources had a negligible share in the energy mix.

<sup>9</sup> National Electricity Plan (2007-2012), Vol-I, 60 (January, 2012), <http://climateobserver.org/wp-content/uploads/2015/01/National-Electricity-Plan.pdf>.

(5780 MW) from Nuclear, 8% (25329.38 MW) from gas, and 16% (50018) from renewable energy sources.

The scarcity of energy has made the policy makers to announce the incremental increase in the generation of the electricity. There is a dire need to augment the sources of energy including renewable energy. Therefore, the government is vehemently advocating the installation and use of cleaner energy. Though the contribution of renewable energy in the total energy mix has substantially increased in the past decade but it still accounts to less than 15 percent of total energy requirement in India, it is highly desirable to increase the availability of renewable energy by manifold. The availability of renewable energy will certainly reduce the dependency on energy sourced from fossil fuel and would also increase the per capita consumption of energy.

Energy security, scarcity of conventional energy resources and environmental concerns highlight the importance of renewable energy. The scarce reference of renewable energy under the Electricity Act, 2003 pushes the development of clean energy on the periphery. The haphazard and uneven regulatory environment adds as an additional barrier to the renewable energy sector. Though the National Electricity Policy promotes private participation in renewable energy sector. However, the high start-up costs for renewable energy sector raises questions of availability and accessibility of energy requirement of individuals or industry. Renewable energy needs to be placed in a separate category of energy industry and treatment of this sector along with other energy sectors would fail to bring the desired result.

## 1.2 Research Problem

The federal polity of the country divides legislative subject matters between the centre and the states. 'Electricity'<sup>10</sup> as a legislative subject matter finds its place in the concurrent list of seventh schedule which confers law making authority upon both the Centre and States. Hence, the determination of the policy on the subject oscillates between the different agencies of the Centre and the States.

Numerous legislations are enacted to address various issues of electricity such as energy security, generation and supply. The Energy Conservation Act 2001, which established the Bureau of Energy Efficiency (BEE) with effect from 1 March 2002 under the Ministry of Power, has got a mission to develop programs and strategies on self-regulation and market principles with primary objective to reduce the energy intensity of the Indian economy.

Electricity Act, 2003 has replaced the 1948 Act and accommodated the agenda of privatization of electricity sector by de-regulation of generation, transmission and distribution segment of the energy industry. The Act also directed the Government of India to prepare the National Electricity Policy and Tariff Policy, in consultation with the State Governments and the Central Electricity Authority (CEA) for development of the power system based on optimal utilization of resources such as coal, natural gas, nuclear substances or materials, hydro, and renewable sources of energy. The sweeping modification was undertaken in the new legislation of 2003, however it fails to accord necessary importance to renewable energy.<sup>11</sup>

Under the Electricity Act (2003) and the National Tariff Policy (2006), the Central Electricity Regulatory Commission (CERC) sets indicative preferential feed-in tariffs (FiTs) for different grid-connected renewable energy technologies including solar,

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<sup>10</sup> The Constitution of India, Seventh Schedule, List III, Entry 38.

<sup>11</sup> The Electricity Act, 2003 - sec. 3 (National Electricity Policy and Plan for development of power system based on optimal utilization of resources including renewable sources of energy); sec. 61(h) (Tariff Regulations by Regulatory Commission to be guided by promotion of generation of electricity from renewable energy sources in their area of jurisdiction); Section 86 (1)(e) (Regulatory Commission to specify Purchase Obligation from renewable energy sources).



while individual state electricity commissions are free to adopt these tariffs or set their own norms.

Amidst an array of the central laws and policies, the position of renewable energy sources requires thorough study along with different policies pursued by the state governments to promote, generate and use of cleaner source of energy. Moreover, the involvement of different ministries such as Ministry of Power, Ministry of New and Renewable Energy, Ministry of Rural Development, Ministry of Urban Development causes lack of coherence in attaining the desirable objective of promotion of renewable energy. As of yet there is no overarching renewable energy law governing all states. Instead, there are separate initiatives by the central and state governments. For instance, JNNSM & Solar Park Scheme is an initiative of the central government, whereas RPOs and RECs come under state jurisdiction. For specific technologies, central government policies and guidelines have been implemented to different degrees by individual states, which can result in inconsistencies between states. For example, states have different policies regarding which entity (developer, power purchaser, or transmission and Distribution Company) is required to finance the extension of transmission and distribution lines when generation facilities are developed beyond the reach of the current grid. States also have different regulations regarding technical standards such as mandating the location of the meter, which affects the measurement of the amount of energy that is sold to the grid. Generation, storage and transmission of renewable energy may, perhaps, warrant different approach from the conventional sources of energy. More so, the growing demand & acceptability of renewable energy and the high targets to be achieved as set by government requires comprehensive approach away from the conventional energy segment.

India being a tropical country has great potential for generation of power from renewable energy sources which will help in meeting the energy demand of the county and sustainable development of the country. And with the target in hand<sup>12</sup> if India makes this massive switch from conventional sources of energy to renewable energy,

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<sup>12</sup> PIB, GoI, MNRE, A new dawn in Renewable Energy- India attains 4th position in global wind power installed capacity (Dec 18, 2016), <http://pib.nic.in/newsite/PrintRelease.aspx?relid=155612>, The Target set for various renewable energy sources are 16725MW, 20450MW, & 22150MW for the years 2017, 2018, & 2019 respectively.

it is possible that 70% of India's electricity needs and 35% of total energy demand could be powered by renewable energy resources by 2030.<sup>13</sup>

### 1.3 Objectives of the study

The objective of this research study undertaken is to investigate the following issues:

1. To undertake a study of existing regulatory framework of Renewable Energy Sector.
2. To understand law and policy relating to renewable energy in India.
3. To analyze whether the existing regulatory regime of the Renewable Energy Sector is addressing the needs of the sector.
4. To identify the mischiefs present in the regulation of Renewable Energy Sector.
5. To propose promotional measures and recommendations in the regulatory framework which will help in the growth of renewable energy in India.

### 1.4 Scope of Research

This study will focus on lacunas in the existing regulatory framework of the Renewable energy sector in India. The research would cover the study of existing framework and its working covering the economic aspects of the renewable energy market. The research will be supplemented by the regulatory framework of the Renewable Energy sector in different jurisdiction.

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<sup>13</sup> Darshan Goswami, *India's Renewable Energy Potential Remains Untapped* (July 23, 2013), <http://www.renewableenergyworld.com/articles/2013/07/indias-renewable-energy-potential-remains-untapped.html>.

## 1.5 Research Methodology

The descriptive research aims to find out the legal and policy framework on renewable energy in the India. The idea underlying the research is to describe the state of affairs existing in the sphere of renewable energy in India.

A doctrinal methodology will be adopted for the formulation of legal reforms through the analysis of existing legal rules and framework. An evaluation of the effectiveness of existing legislations governing the sector shall be adopted as a method of research.

The research methodology requires gathering relevant data from the specified documents and compiling databases in order to analyze the material and arrive at a more complete understanding of the Regulatory Framework of the Renewable sector and the issues attached to it.

The methods commonly used in descriptive research are survey methods of all kinds, including comparative and co-relational methods, and fact-finding enquiries of different kinds. Different legislations on electricity sector are identified to trace the reference of renewable energy and provisions thereto. These provisions are analysed to understand the position and status of renewable within the legislative and policy framework. For such a doctrinal study, primary and secondary sources will be relied upon. This study will also make comparative study to analyse the existence of separate legal and policy framework in different states of India and a comparative study analyse the framework in India with other countries.

## **1.6 Outcome of the study**

The study will bring out a comprehensive report on existing legal and policy framework on renewable energy. The study will highlight the references of renewable energy in the Electricity Act, 2003 and National Electricity Policy. This study will map out renewable energy policies of different states India and their coherences/differences with the National Electricity Policy and may also suggest required changes in the existing policies relating to renewable energy in India in order to promote generation and use of renewable energy. This study may also recommend changes in the regulatory framework after analysis of the policies adopted by other countries in order to address to the unattended mischiefs.

## CHAPTER 2

### OVERVIEW OF THE INDIA'S RENEWABLE ENERGY SECTOR

Recent years have shown unprecedented growth in the area of renewable energy<sup>14</sup>, the renewable energy sector has managed to hold its grip in the energy sector due to its replenishable nature and the ever increasing demand for energy. However, a consistent support of the government is imperative for the sector to keep the cost of product competitive with other energy sources and for technological advancement in the sector. Promotion of renewable energy in India effectively started after the 1970's & 1980's energy crisis<sup>15</sup>, when the government constituted Commission for Additional Sources of Energy (CASE) under the Department of Science and Technology in 1981. The Commission was entrusted with the responsibility of formulating policies and implementation of such policies, programmes for the development of renewable energy and was vested with the responsibility of coordinating and intensifying R&D in the sector. The department was later converted into an independent department as Department of Non-conventional Energy Sources (DNES) in 1982 under the then Ministry of Energy and since then renewable energy sector in India has witnessed considerable development.

In 1992, the Government of India upgraded the Department of Non-conventional Energy Sources and constituted Ministry of Non-Conventional Energy Sources (MNES), the world's first ministry committed specifically to renewable energy. The ministry was later renamed as Ministry of New and Renewable Energy (MNRE) in 2006. The Ministry is dedicated to expanding contributions of renewable energy in all of India's end-use sectors and undertakes policy and planning activities to that end. It

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<sup>14</sup> Supra note, 8.

<sup>15</sup> Energy Crisis of 1970's started with the oil embargo by OPEC countries in 1973 and the price hike in 1979 due to Iranian Revolution. Refer to respective sources for further information – History.com Staff, *Energy Crisis (1970s)*, (2010), available at <http://www.history.com/topics/energy-crisis>.  
History.com Staff, *OPEC states raise oil prices*, (2010), available at <http://www.history.com/this-day-in-history/opec-states-raise-oil-prices>.

was constituted to facilitate research, design, development, manufacture and deployment of renewable energy devices and systems for transportation, portable and stationary applications in urban, rural, industrial and commercial sectors.

MNRE also supervises national-level renewable energy institutes such as the Centre for Wind Energy Technology and Solar Energy Centre. Along with MNRE there are several other government institutions with direct responsibilities that extend into renewable energy include several units under the Ministry of Power, the Planning Commission, and the Prime Minister's Council on Climate Change, which will be discussed subsequently.

## 2.1 Historical Background

India witnessed evolution of energy sector in 1880s when the generation of power supply at a very small scale took place in the city of Darjeeling. The first legislative intervention, in the year 1887<sup>16</sup>, allowed the private players in generation of the electricity with minimal regulation with the government. The Act was introduced only for the purpose of protecting person and property from the risk incidental to the use and supply of electricity. Later, Calcutta Electricity Lightning Act, 1895 and Howrah Bridge Electrical Lightning Act, 1902 were introduced for the regulation of electrification in Calcutta province and the Howrah bridge. The Indian Electricity Act of 1903<sup>17</sup> replaced the Electricity Act of 1887, Calcutta Electricity Lightning Act, 1895 and Howrah Bridge Electrical Lightning Act, 1902, and introduced licencing system for the first time in the Indian electricity sector for the regulation of the sector. The Act empowered the Local Government to grant licence to individuals for supply of electricity to public or in any public place.<sup>18</sup> In 1910 the Indian Electricity Act of 1910<sup>19</sup> was passed which created the basic legal framework for the sector and incorporated provisions for generation, supply, transmission, and use of electricity. The Act empowered the State Government to grant licence for supply of electricity<sup>20</sup> and a non-

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<sup>16</sup> ACT No. XIII OF 1887, <http://lawmin.nic.in/legislative/textofcentralacts/1887.pdf>.

<sup>17</sup> ACT No. III OF 1903, <http://lawmin.nic.in/legislative/textofcentralacts/1903.pdf>.

<sup>18</sup> *Ibid* sec. 3.

<sup>19</sup> ACT No. IX OF 1910, <http://cercind.gov.in/IEA1910.pdf>.

<sup>20</sup> *Ibid*. sec. 3.

licensee could also supply electricity with the prior permission of the State government<sup>21</sup>. The Act created a legal obligation upon the licensee to supply electricity to any person who applies for it in his area.<sup>22</sup> The act also provide for a meter system for recording consumption of electricity<sup>23</sup> and also imposed criminal liability for theft of electricity<sup>24</sup>. The 1937 amendment inserted sec. 36A which provided for the creation of Central Electricity Board with powers to make rules for regulation of the sector. <sup>25</sup>

During the pre-independence period, the electricity sector was highly competitive with the limited role of the state to give licenses to the players in order to establish uniformity in the sector. The state monopoly in the generation, transmission and distribution of electricity began with the enactment of the Electricity (Supply) Act, 1948 on the line of the nationalization undertaken in the UK in the year 1947. During these periods, the energy was primarily produced from conventional sources of energy i.e., coal. Therefore, the laws were generally related with those energy generating companies which were fossil-fuel based. The major legislative change was introduced in the year 2003 whereby a liberal framework was created to facilitate the role of private players in the sector and also attention was attracted to look beyond conventional sources of energy. For the first time, the 2003 Act referred to the cleaner sources of energy as a source of generation of energy and mechanism to promote the same along with fossil fuel based energy. There is a detail description of the provisions dealing with renewable energy in this chapter.

Energy supply or energy security is fundamental for continuous economic development. In the period of 5<sup>th</sup> Year Plan there was sharp increase in price of imported oil which caused insecurity and instability in energy supply. The planners were compelled to think of alternative sources of energy which can be produced domestically to reduce the dependence on imports. Renewable energy (non-commercial sources) was being considered as alternative sources of energy. The renewable energy planning started form the 6<sup>th</sup> Plan (1980-85). Initially it was introduced for meeting the rural energy demand. With the success of the initial projects and the advancement in

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<sup>21</sup> *Supra Note 4*, sec. 28-30.

<sup>22</sup> *Supra Note 4*, sec. 22.

<sup>23</sup> *Supra Note 4*, sec. 26.

<sup>24</sup> *Supra Note 4*, sec. 39.

<sup>25</sup> Act No. X of 1937, <http://lawmin.nic.in/legislative/textofcentralacts/1937.pdf>.

the sector such sources were taken into consideration as the alternative sources of conventional energies in urban areas as well.

### **6<sup>th</sup> Plan (1980-85)**

In the 6<sup>th</sup> Plan the energy strategy exploitation of renewable sources of energy like forestry and biogas specially to meet the energy requirements of rural communities was incorporated. The development and demonstration of the technology of renewable energy was adopted under a comprehensive programme. The broad approach for the development of new and renewable sources of energy in the Plan was<sup>26</sup>:

- (a) to implement on a large scale programmes such as those of energy forestry and biogas where technology development has already reached a stage which permits field application;
- (b) to carry out field testing and demonstration on a country wide basis of technologies, which have the potential to become commercially viable in the next five to seven years; and
- (c) to intensify research and development of other technologies where the potential is likely to be available over a longer time horizon.

The programme included the important new and renewable sources of energy such as solar, wind, bio-mass, chemical etc. It even suggested setting up an Alternative Energy commission to enhance the development of renewable sources of energy. We may discuss various energy sources planning in the following way:

In those days traditional fuels (fire wood) used to contribute almost two third of the total energy from non-commercial sources<sup>27</sup> as the rural communities were heavily **dependent on firewood**. It was targeted to **plantation on 13 lakh hectares** for this purpose.

### **Biogas:**

The animal wastes are converted through a process in to biogas. This biogas not only provides much needed energy to the rural families reducing the pressure on fire wood supplies but yields valuable organic manure. It was observed that various utilities were

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<sup>26</sup> Planning Commission of India, Sixth Five Year Plan, *available at* <http://planningcommission.nic.in/plans/planrel/fiveyr/6th/6planch15.html> (last visited July 15, 2016).

<sup>27</sup> *ibid.*



engaged in harnessing these resources. The Planning Commission considered the various problems relating to technological problems in the process, materials, maintenance of those along with financial support in this process and undertook ambitious programme of installation of biogas plants. About one million family size plants and 100 community plants were proposed to be set up during the Sixth Plan<sup>28</sup> along with financial and technical support. This Plan also recommended for the wide circulation of the information relating to this biogas and its applications.

**Solar Energy:**

India comes under tropical region that provides opportunities to harness solar energy here. The primary difficulties lies in the solar power programme are technological skills and high start-up cost. In those days making of solar cells were in developing stage. Some improvement in machinery was there in case of producing low heat from solar energy.

The 6th Plan primarily undertook the technological development programme relating to solar energy harnessing. A national demonstration programme based on solar energy harnessing system was also recommended to launch in this Plan.

**Biomass:**

This Plan recommended for the establishing of two centers for research for biomass for the advance research in this field contributing in developing the ideas of procuring energy from this field.

**Wind energy:**

In case of wind energy, these days were passing through the research activities in this field. This Plan gave importance on promotion of research work in these areas. Two centers for conducting R&D in problems relating to wind energy utilisation were commissioned to be set up in the Sixth Plan.

**Hydro power:**

Hydro power plan needed economic and workable programme including application of local technology and local human resources.

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<sup>28</sup> Supra note, 26.

### **Observations:**

At the end of the 6<sup>th</sup> Plan two important institutes came into existence in central level namely the Commission on Additional Sources of Energy in 1981 and the Department of Non-conventional Energy Sources in 1982.

In case of Bio-energy the National Project on Biogas Development was sectioned as a Central Sector Scheme. This scheme was successful but in practice its activities were hampered due to shortage of cement and steel along with land availability for installation of the plants. The setting up of community and institutional biogas plant (CBP/IBP) was taken up systematically since 1983-84<sup>29</sup>. Next three biomass research center were set up. These centers were engaged with performing research work and dissemination of information regarding these resources.

This Plan was able to create general awareness in Solar Thermal Energy throughout the country. The necessity of technological development was needed. The development in solar thermal devices was noticed. The Thermal Energy Centre was working from this period. A wide-ranging programme of R&D in the area of SPVs has been initiated with a view to reducing costs, improving production technologies<sup>30</sup>.

Solar pumps for drinking water supply and irrigation and photovoltaic street lighting in villages, were installed for demonstration and extension programme under **a National Solar Photovoltaics Energy Development Programme (NASPED)**<sup>31</sup>.

In this period wind pump mills were established. The programme included development and demonstration of wind pumps for irrigation and drinking water<sup>32</sup>. The government took initial steps to **tap low-capacity micro-hydel potential** in this period. A small demonstration programme was also taken up during the Sixth Plan<sup>33</sup>. The improved Chullahs were introduced to reduce the firewood consumption. So in this period number of programmes on promotion of renewable energy resources was launched along with some research work. The experience in this Plan guided the nation towards the 7<sup>th</sup> Plan.

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<sup>29</sup> *supra* note, 26.

<sup>30</sup> *supra* note, 26.

<sup>31</sup> *supra* note, 26.

<sup>32</sup> *supra* note, 26.

<sup>33</sup> *supra* note, 26.

## 7<sup>th</sup> Plan (1985-90)

The 7<sup>th</sup> Plan focused on the development and accelerated utilization of renewable energy sources technically and economically.<sup>34</sup> This Plan focused on the development and utilization of renewable energy resources both economically and technically. This Plan also gave importance on the access by the rural people in renewable energy. A large number of demonstration projects for the promotion were also considered for these periods. The communication of information relating to renewable resources was circulated through the proper training and education. It was also important to properly maintain the instruments in various energy generating project and handling of such equipment requires technical skills and knowledge. The strategy of the period was exploitation of renewable sources of energy like biomass, energy forestry, wind, bio-gas, solar energy, etc. especially to meet the energy requirements of rural communities<sup>35</sup>.

The approach of this Plan was:

- Research and Development (R & D)
- Creation of Demand through Economic Measures
- Infrastructure
- Removing Social and Cultural Constraints through Education and Extension and Training

Some important recommendation for by the Planning Commission:

- To initiate R & D in various areas to achieve ultimate and efficient use of energy resources
- As renewable energy resources were used in traditional ways it was necessary to promote education and training regarding this issue.
- Renewable energy resources require proper infrastructure to efficient use of that. So this Plan recommend for the infrastructure development in this respect.

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<sup>34</sup> Planning Commission of India, Seventh Five Year Plan, *available at* <http://planningcommission.nic.in/plans/planrel/fiveyr/default.html> (last visited July 15, 2016)

<sup>35</sup> Id.

## **New and Renewable Sources of Energy Programmes**

### **Bio-energy:**

Again in this plan the Commission recommended for the continuation of National Project on Biogas Development with a further goal to provide the necessary equipment for the biogas plant in reduced price. Six bio-mass centres were proposed to be set up in different parts of the country for providing R & D back-up for these demonstration and operational programmes.<sup>36</sup>

### **Solar Energy**

In this Plan it was recommended for the extended programmes in solar photovoltaic and solar thermal energy and of field demonstration. It was considered for setting up a national testing facility for testing and calibrating solar photovoltaic components.

### **Wind Energy**

Development in technology in wind energy generation was recommended for this period but not much emphasis was given.

### **Improved Chullahs:**

In case of improved Chullahs it was recommended for the continuation of the activities to distribute that chullahs but on reduced subsidies.

### **Observations:**

The major programmes for new and renewable sources of energy which were developed and enlarged during the Seventh Plan and Annual Plans 1990-91 and 1991-92 included the National Project on Biogas Development, National Programme on improved Chullahs, Solar Thermal Energy Utilisation, Solar Photovoltaics (SPV), Wind Energy and conversion of Biomass into energy, energy plantation and biomass gasifiers. Significant progress was achieved in the generation of electric power from solar photovoltaics for lighting and pumping systems, micro hydel schemes, gasifiers based on wood and agricultural waste and wind generation, including wind farms and "stand

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<sup>36</sup> Supra note, 34.

alone" wind, turbines. **Indiana Renewable Energy Development Agency' (IREDA)** was set up. A National Solar Energy Centre has been set up<sup>37</sup>.

In this period **family-size biogas programme** was successful and it was extended. The deficiency was in the promotion of community/institutional biogas plants due to less participation of the people. **Improved chullahs** were also well accepted by the people. The subsidy in each chullah was also reduced in this period.

In 7<sup>th</sup> Plan period **Solar Thermal devices** especially solar cookers and solar heating devices were being manufactured. The quality of those materials was also developed in this period. Solar PV cells were being utilized under the rural electrification programme in spite of its initial cost of capital.

Harnessing wind energy in these period was not much successful. Most of equipment needed for the generation of power from wind was imported. Shortage of local equipments and unskilled maintenance of the existing project was a real problem for this sector. Few companies started to manufacture these equipments showing ray of hope in the promotion of wind energy project in India. Similarly, Hydel power projects were also lagging behind in this period due to financial and technological reasons.

### 8<sup>th</sup> Plan (1992-97)

At the beginning of the 8<sup>th</sup> Plan i.e. 1992 a new ministry i.e. **Ministry of Non-Conventional Energy Sources**, exclusively dealing with renewable energy resources came in to existence. The Planning Commission also took comprehensive attempt to plan the renewable resource from this period.

The Commission observed that efficient use of resources including renewable energy resources is fundamental for the sustainable development of the economy planning.

**Planning of renewable resources:** In this Plan some issues were given priority in short term basis and other matter were considered for the medium and long term as:

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<sup>37</sup> Supre note, 24.

- Short term -“Maximise satisfaction of demand for energy from indigenous resources ”
- Medium Term- “a) initiate action for accelerated development of all renewable energy resources, especially the available hydro- electric potential” and  
b) Promote R & D effort on decentralised energy technologies based on renewable resources”
- Long term: “Promote an energy supply system based largely on renewable sources of energy.”

The impact of these initiatives may be noted in the activities by the government in the promotion of renewable energy throughout the period of 8<sup>th</sup> Five Year Plan. During the Eighth Plan period the government gave much importance on new and renewable energy resources and focused on the cooking and heating needs of the rural areas of the country through programme of Biogas, improved chullas, low grade solar and thermal device. *“At least 750 to 1000 MW of power capacity would be installed on the basis of NRSE technologies of wind energy, micro hydel, urban/agricultural wastes, solar photovoltaics and also cogeneration programmes wherever feasible ”*<sup>38</sup>.

This plan continued the central finance and technical support to the New Renewable Energy Resources. The plan made several efforts to promote large scale commercialisation of New and Renewable Sources of Energy devices. It promoted development and commercialization of indigenous devices in renewable energy sector for proper use of solar and wind energy. It emphasised on the importance of micro hydel especially in hilly areas and promoted Co-generation schemes which would be promoted especially in process industries using biomass and agricultural residues. Now we are going to discuss the NRSE programme in the following:

### **Biogas:**

An extended programme was proposed for biogas under the National Project on Biogas involving local communities help.

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<sup>38</sup> Planning Commission of India, Eighth Five Year Plan, <http://planningcommission.nic.in/plans/planrel/fiveyr/9th/vol2/v2c6-1.htm> (last visited July 15, 2016).

**National Programme on Improved Chullahs:**

The National Programme on Improved Chullahas was expanded to cover up to 10% of total rural households in the country during the Eighth Plan. This programme also proposed to transfer to States gradually.

**Solar Thermal Programme:**

The programme was to promote low grade solar thermal devices in this Plan. Effort were made for the promotion of Thermal Power Plant with the help of indigenous technology in this field.

**Solar Photovoltaics:**

This Plan emphasised on the development of thin film amorphous silicon cell.

**Wind energy:**

Wind power generation got importance along with the indigenous equipments.

**Micro hydels:**

This Plan proposed for the canal cluster approach for micro hydel projects.

**Biomass:**

Research and Development programme in this area were linkd with the National Wasteland Development Board Programme.

**Urban Waste:**

Main focus was on research and development and commercialization of incineration and other waste disposal technologies.

**Battery Power Vehicle:**

This programme undertook for the better design of chopper control, fast battery changers and development of AC drive system.

**Miscellaneous Programes:**

A programme included alternate fuels, geo-thermal energy, ocean energy, chemical sources of energy, hydrogen energy and magneto hydro dynamic. It was proposed to

intensify these R and D efforts in the Eighth Plan with the involvement of the academic institutions, CSIR system and other public and private R and D institutions.

**Indian Renewable Energy Development Agency (IREDA):**

Along with other financing institutions IREDA was provided funding for development of new technologies for harnessing renewable sources of energy and for supporting projects for improving design, efficiency and cost effectiveness of existing commercially viable NRSE technologies.

**Energy Conservation:**

It was proposed to launch a comprehensive National Energy Efficiency Programme (NEEP) in the Eighth Plan, which would coordinate and organise existing and new efforts and activities on energy conservation in the different sectors of the economy.

**Observations:** A review of these promotional activities and its consequences on renewable energy resources may be found in the 2<sup>nd</sup> volume of the 9<sup>th</sup> Planning Commission Document. For easy understanding a short note on this is given below:

In the 8<sup>th</sup> Plan solar cookers and solar Photo Voltaics programmes for the lighting in villages has been satisfactory. But generation of electricity from solar energy was lagging behind. In this period wind power programme was very successful. These periods achieved 860MW while the target was only 100MW. It opened a new era and many states having potential on wind energy came forwarded along with the private entities to exploit this resource<sup>39</sup>.

In case biomass power and co-generation, these years were much behind from success as the target was of 300MW while achievement was only 115MW. Even the cogeneration in sugar industries also failed to achieve the desired goal. Another disappointing story was in case of Small Hydro programme. These sources could only generate 93MW when the target was 200MW. The proper infrastructure, technology and financing from states were the main reasons behind this failure. This programme also failed to achieve its goal in both physical and financial terms. The amount (in both

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<sup>39</sup> Id.



section Center and States) allotted for this programme remained unutilized. The number of block was also not covered fully by this programme.

This Plan witnessed a successful activities in case of socially oriented programmes like biogas, improved chulhas, solar cookers, solar PV programmes for lighting in villages. But procurement of power from biomass was also much short. It could achieve only 135MW out of targeted 300MW.

At the end of the 8<sup>th</sup> Plan some defects which are primarily responsible for the slow progress in achieving the desired results may be noted here. High initial cost and financing issues like less finding, improper use of fund etc. weakened the programme. In a vast country like India there are various institutions involve both in state and state level in harnessing energy. The solar projects, wind project etc needed skilled technical support which was lacking at that period. Next one is buy-back of power by the agencies. The grid and transmission system of the electricity is very poor hindering the marketing of electricity generating from renewable energy sources. Absence of suitable legislation, policy and regulatory body are also responsible for the poor development in the area of renewable energy resources in India.

### **9<sup>th</sup> Plan (1997-2002)**

As noted in previous Plans, structural weakness and financial constraint were the main difficulties in the way to reach the goal. So in the 9<sup>th</sup> Plan the planners gave importance of commercialization and of introduction of private partners in exploiting renewable energy resources. This Plan put emphasise on generating electricity from renewable energy sources and selling to the electricity board in reasonable price to promote a market for the renewable energy electricity. The regulatory weakness also caused improper expansion of this sector. So they talked about the necessary legislation.

Next important thing regarding this issue was that of subsidy in various programme provided by the government. They wanted to change in the policy in subsidy system in the socially oriented programmes like Bio-gas, Improved Chulhas, Biomass and Solar

Photo Voltaics programmes along with cogeneration in this Plan<sup>40</sup>. They also talked about the wide research programme in this field.

#### **National Programmed on Improved Chullahs:**

The programme was recommended to transfer to the State during this 9<sup>th</sup> Plan.

#### **Wind Power:**

The wind power energy programme attained a commercial stage. The planners recommend for the promotion of private participation and support of fiscal incentives during this period

#### **Small Hydro Power:**

The power project could not get importance but in the current period the planning commission recommend for bringing of Centrally Sponsored Scheme for this.

#### **Biomass power:**

The biomass power programme comprises the biomass combustion programme, biomass gasifies and cogeneration programmes which was aimed at achieving a minimum target of 500 MW in this Plan with the inclusion of private sector especially in the cogeneration power sector from sugar industries.

#### **Solar power**

The 9<sup>th</sup> Plan emphasizes on the promotion of the solar power programme. The high start-up cost of the solar power plant and technological support are main concern for solar power plant along with power marketing management. It was felt important to strengthen the R & D setup and to bring down the cost of production of solar cells through fiscal and financial measures. It was also desired to establish pilot solar power plant both through solar thermal and solar photovoltaic technologies ensuring fund and technology and a preliminary survey was also required for the same to enquire its technological aspect.

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<sup>40</sup>Planning Commission of India, Ninth Five Year Plan, available at <http://planningcommission.nic.in/plans/planrel/fiveyr/9th/vol2/v2c6-3.htm> (last visited July 15, 2016).

Solar Energy Programme<sup>41</sup> was planned to be extended in this Plan by establishing proper maintenance system. In the 8<sup>th</sup> Plan maintenance was the main drawback to this programme. It was thought about the involvement of local people at village level and the introduction of advance solar cooker also. Solar water heater got importance in this Plan.

Unlike the 8<sup>th</sup> Plan subsidizing system, in this Plan it was felt necessary to phase out the subsidy in major programmes of solar photovoltaics.

Regarding rural energy, biomass energy programme including biomass production, biogas, improved chulhas, gasifies, solar energy etc assures importance in 9<sup>th</sup> Plan along with wide extension of National Project on Biogas Development (NPBD) but the programme like National Programme on Improved Chullas was being considered to transfer to the States.

#### **Observations:**

In the 9<sup>th</sup> Plan period the structural changes were taken place. The commercialization of the projects was given much importance along with large co-generation of energy in this field. In this period initiatives were taken to bring down the quantum of subsidies in socially oriented programmes (direct capital). They recommended for a thorough evaluation for the subsidy programme for the future continuation of these programme in 10<sup>th</sup> Plan.

#### **10<sup>th</sup> Plan (2002-2007)**

#### **The 10<sup>th</sup> Plan recommendations are as following:**

- It was proposed for the identification of areas to provide off-grid power supply from the renewable sources with local or private sector management in this area. This Plan proposed for the integrated generation and distribution of off-grid energy supply.

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<sup>41</sup> which includes the solar thermal water heaters, solar cookers, solar dryers, solar desalination systems and solar photovoltaic street lights, solar photovoltaic domestic lights, solar lanterns etc

- According to the planners a comprehensive review of all programmes was necessary.
- It was also necessary to change in framework in power supply and dealing of power.
- The private participation in renewable energy sector through bidding process was also recommended.
- Another important thing was the integration of renewable energy technologies in all buildings.
- Lastly the Plan recommended for the increased plants especially on degraded forest and community land.

**Observations:**

During the 10<sup>th</sup> plan it was noticed that the solar thermal power programmes were lagging while wind power programmes were very successful. The rural energy, urban applications, and R & D programmes had been implemented during the 10<sup>th</sup> Plan. The rural electrification programme with the help of renewable energy was also effective in this period. “Village Energy Security Projects are under implementation in 100 villages. Around 5 lakh biogas plants have been installed. In the programmes catering to the requirement of urban areas under the solar water heaters programmes 12.5 lakh sq m collector areas of water heating systems have been installed. R&D activities have been carried out especially in the area of alternative fuel for transport including hydrogen energy<sup>42</sup>”

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<sup>42</sup> Planning Commission of India, Tenth Five Year Plan, *available at* [http://planningcommission.nic.in/plans/planrel/fiveyr/10th/volume3/10th\\_vol3.pdf](http://planningcommission.nic.in/plans/planrel/fiveyr/10th/volume3/10th_vol3.pdf) (last visited July 15, 2016).

## 11<sup>th</sup> Plan (2007-2012)

### **Mission of the MNRE<sup>43</sup>:**

Reduce dependence on oil import, increase share of clean power, enlarge clean energy availability, encourage renewable energy supply cost competitive

### **MNRE Programme:**

The programme covers the followings:

1. grid connected and stand-alone power generation from small hydro, wind, solar, biomass, and industrial/urban wastes;
2. rural energy programmes such as electrification of remote villages, biogas, and improved chulhas for cooking;
3. solar energy applications such as thermal water heaters, solar photovoltaic applications for lighting and water pumping; and
4. integrated rural energy programme (IREP).

Research, development, and demonstration programmes in new technologies such as geo-thermal, hydrogen energy, fuel cells, alternative fuels for surface transport, etc., are also undertaken by MNRE.

### **Eleventh Plan Programme**

The various programmes of the MNRE for the Eleventh Plan have been drawn up in the light of recommendation made by Planning Commission and those made in IREP.

- Grid Interactive and Distributed Renewable Power.
- Renewable Energy for Rural Applications.
- Renewable Energy for Urban, Industrial, and Commercial Applications.
- Research, Design, and Development for New and Renewable Energy.
- Information, publicity and extension, international relations, HRD and training, equity support to IREDA and spill-over liabilities

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<sup>43</sup> Planning Commission of India, Eleventh Five year Plan, *available at* [http://planningcommission.nic.in/plans/planrel/fiveyr/11th/11\\_v3/11th\\_vol3.pdf](http://planningcommission.nic.in/plans/planrel/fiveyr/11th/11_v3/11th_vol3.pdf) (last visited July 15, 2016).

## **Policy Approach**

This plan discusses about the policy approach which says that

- The Capital subsidies that encourage investment without ensuring outcomes would be phased out. Incentives provided for grid connected power from renewable sources would be linked to generation and not to power capacities created. Thus power regulators will be asked to create alternative incentive structures such as mandated feed-in laws or differential tariffs for grid interactive power.
- Alternatively grid interactive renewable power will be promoted by mandating a renewable portfolio standard for all power distribution companies and providing a subsidy for each unit of renewable electricity purchased. Many state Electricity Regulators have stipulated RPS as required by the Electricity Act 2003.
- Instead of subsidy a reward may be given to one who sells a lakh or million units frits it will promote competition and innovation and development
- For biofuels a well-defined policy providing incentives is required.
- IREDA must be restructured to facilitate the financing to the renewable power projects.

## **Research and Development:**

The 11<sup>th</sup> Plan recommended the following steps to be taken by the R & D:

- R&D must take more active initiative in promoting renewable energy harnessing and distributing
- The report of the EC on Integrated Energy Policy has recommended setting up of a National Energy Fund (NEF [R&D]) for supporting studies on a regular basis in a number of institutions.
- A separate working group on R&D for energy sector
- It talks about the adoption of National Technology Mission mentioned in 11<sup>th</sup> plan (p. 390)

## 12<sup>th</sup> Plan (2012-17)

### 12<sup>th</sup> Plan Strategy

The areas on which attention should be focused during the Twelfth Plan are:

- Grid interactive and off-Grid/Distributed Renewable Power
- Renewable Energy for Rural Application
- Renewable Energy for Urban, Industrial and Commercial Applications
- Research, Design and Development for New and Renewable Energy

Strengthening of Institutional Mechanism for enhanced deployment and creation of public awareness.<sup>44</sup> The National Action Plan for Climate Change (NAPCC) also envisages that the share of renewable electricity in the electricity mix should be 12% by 2016-17 that requires 52000MW renewable power.

Schemes flows from the Eleventh Plan are as follows:

#### **Grid Connected Renewable Power**

3000MW Grid Connected Renewable Power proposed for,

It had been planned for the increase in RPOs by state along with accelerated depreciation benefit for wind power.

Tariff for Solar power under JNNSM is expected to continue falling due to enhanced indigenisation and local manufacturing. Further, to ensure volumes GBI support will be continued in the Twelfth Five Year Plan. It was also talked to restrict the upfront subsidy support for Small Hydro plants to 10 MW size of hydro plants from an existing size of 25 MW.

#### **Off-Grid Distributed Renewable Power**

A target of 3400MW of power was in plan from off-grid renewable that was almost five times the targets of 11<sup>th</sup> Plan. Another 2000MW form cogeneration in non-bagasse industry. 1,000 MW of off-grid solar capacity addition has been proposed in line with

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<sup>44</sup> Planning Commission of India, Twelfth Five Year Plan, *available at* [http://planningcommission.gov.in/plans/planrel/12thplan/pdf/12fyp\\_vol2.pdf](http://planningcommission.gov.in/plans/planrel/12thplan/pdf/12fyp_vol2.pdf) (last visited July 15, 2016).

the targets of phase-2 of Jawaharlal Nehru Solar Mission. The financing for incentives for such projects would be sourced from a pool of funds originating out of National Clean Energy Fund, CSR activities and tax-free donations.

### **Renewable Energy for Rural Applications for Cooking**

Solar cooker programme intended to continue with a proposal to include it in mid-day meal programme.

### **Renewable Energy for Rural Electricity Access:**

In the rural areas off grid electrification was effective and agreed to continue some successful model like Solar home lighting systems through banking system, entrepreneur based biomass gasifier models for providing electricity for lighting, and mini micro hydro system.

The very characteristics in terms of variability in availability of renewable resources it was emphasized on pump water storage hydro-plant.

### **Off Grid Solution for Industrial, Commercial and Buildings Applications:**

The planers proposed to continue with the solar water heater schemes along with the extended concept of green building including green cities.

### **Major new initiatives:**

In the area of renewable energy we may site following new initiatives:

- **National Institute of Solar Energy:**

For advance research in solar technology the existing Solar Energy Centre was proposed to be converted in to autonomous institution.

- **National Bio-energy Corporation of India:**

National Bio Energy Corporation of India (NBECL) will be set up to implement bio-energy mission including cook stove programme.

- **Renewable Energy Development Fund:**

A Renewable Energy Development Fund could be supportive to address the financing constraint of the grid connected as well as the off-grid applications of renewable.



- **National Bio-energy Mission:**

The Biomass Mission was proposed to launch based on agricultural residue with aiming commercialization of the sector.

- **Renewable Power Evacuation Infrastructure:**

Evacuation in fracture and transmission facilities were needed for renewable energy power in time bound manner supporting large expansion in consumption and production of renewable energy.

- **National Biomass Cook Stove Programme:**

The proposed initiative plans to universalize access of improved biomass cook stoves by providing assistance in exploring a range of technology deployments, biomass processing and delivery models leveraging public-private partnerships.<sup>45</sup>

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<sup>45</sup> Available at [http://planningcommission.gov.in/plans/planrel/12thplan/pdf/12fyp\\_vol2.pdf](http://planningcommission.gov.in/plans/planrel/12thplan/pdf/12fyp_vol2.pdf) (last visited October 11, 2016).

## 2.2 Constitutional Prospective

Article 1 of the Constitution call for India to be a Union of States creating a federal structure in India where two governing agencies i.e. the Centre and the State parallelly govern the nation (The Central government responsible for the whole nation and State government concerned with the affairs of the federal unit). For a quasi-federal state such as India good governance structure is only possible through clear demarcation of power and areas of governance, and through coordination among the States and the Centre. A clear demarcation of Legislative and Executive power of the Centre and the State has been provided under the Constitution of India but with electricity being a subject matter of concurrent list poses hurdles in the implementation of the laws and policies.

The executive power of the Centre extends to the matters upon which the Parliament can legislate, and to the exercise of rights, authority and jurisdiction available to Government of India under any treaty or agreement but it cannot legislate upon subjects enumerated expressly in the State list unless expressly provided by the constitution.<sup>46</sup>The executive power of the State extends to matters on which State Legislature can legislate but in case where both State and Centre has power to make law, the powers of the State executive are limited by the provisions of the constitution, and by laws expressly made by the Parliament.<sup>47</sup> Similarly, article 245 of the Constitution underlines the powers of the Parliament and State Legislature and empowers Parliament to make laws for the whole of India or any part thereof, and the State legislature to make laws only for the concerned State. The law making power of the State legislature is limited by territory but the power of the Parliament to make law extends over the whole country and can even extend beyond territorial limits of the country under certain circumstances.

The legislative subject matters on which a particular legislature can legislate upon is also divided between the Centre and the States<sup>48</sup> depending upon the nature of the

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<sup>46</sup> The Constitution of India, 1950, art 73.

<sup>47</sup> *Ibid.* art 162.

<sup>48</sup> Constitution of India, art. 246 - Subject matter of laws made by Parliament and by the Legislatures of States

subject i.e. if it is of national importance such as defense or foreign policy then the power to legislate vest with Parliament and if it is of State deliberation such as agriculture or police then power rest with State Legislature. The division of subject matter of legislation as a domain of Central or State Legislature was adopted under Government of India Act, 1935 which was later adopted by our Constitution; a Union List containing matters of national importance, a State List for matters of State interest/concern and a Concurrent List was formed under the Constitution. The subject matter which were not purely of national importance and neither were of pure State interest, or subjects matters which were though of state interest but required uniformity at national level (e.g. procedural laws, personal laws, etc.) were placed in the Concurrent List wherein Centre and State both were given power to legislate.<sup>49</sup>

In our constitution different modes of power generation are distributed among the Centre and States. The Parliament has the power to enact laws with respect to petroleum and petroleum products<sup>50</sup> and Natural Gas<sup>51</sup>, and regulate oilfields and mineral oil resources, whereas the State Legislature is empowered with regulation, production and distribution of artificial gas and other gas works<sup>52</sup>. The Centre holds the power to regulate and develop inter-State rivers and river valleys<sup>53</sup> but at the same time the constitution empowers the State to make laws for small rivers and for rivers which are

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Notwithstanding anything in clauses ( 2 ) and ( 3 ), Parliament has exclusive power to make laws with respect to any of the matters enumerated in List I in the Seventh Schedule (in this Constitution referred to as the Union List)

Notwithstanding anything in clause ( 3 ), Parliament, and, subject to clause ( 1 ), the Legislature of any State also, have power to make laws with respect to any of the matters enumerated in List III in the Seventh Schedule (in this Constitution referred to as the Concurrent List)

Subject to clauses (1) and (2), the Legislature of any State has exclusive power to make laws for such State or any part thereof with respect to any of the matters enumerated in List II in the Seventh Schedule (in this Constitution referred to as the "State List").

Parliament has power to make laws with respect to any matter for any part of the territory of India not included (in a State) notwithstanding that such matter is a matter enumerated in the State List.

<sup>49</sup> Indian Constitutional Reform (1933-34), Vol.1 Part 1 Sec. 2 Ch. 2 pp.- 30-31, 51 *available at <http://dspace.wbpublibnet.gov.in:8080/jspui/handle/10689/11628>* - Experience has shown, both in India and elsewhere, that there are certain matters which cannot be allocated exclusively either to a Central or Provincial legislature, and for which, though it is often desirable that provincial legislation should make provision, it is equally necessary that the Central Legislation should also have a legislative jurisdiction, to enable it in some case to secure uniformity in the main principles of law throughout the county, in others to guide and encourage provincial efforts, and in others again to provide remedies for mischiefs arising in the provincial sphere but extending or liable to extend beyond the boundaries of a single Province.

<sup>50</sup> Supra note 46, Sch. VII, List – I, Entry – 53.

<sup>51</sup> Association Of Natural Gas v. Union Of India, (2004) 4 SCC 489.

<sup>52</sup> The Constitution of India, 1950, Sch. VII, List – II, Entry – 25.

<sup>53</sup> Sch.VII List II Entry – 56.

not regulated by the Centre<sup>54</sup>. The Parliament has power to make laws for Atomic energy and also for all the mineral resources necessary for its production.<sup>55</sup>The Central Government also regulates mines and mineral development<sup>56</sup>

‘Electricity’<sup>57</sup> is a subject matter enumerated in the Concurrent List and the Parliament and State Legislature both have power to make laws to regulate the sector. Electricity as a subject matter was added to concurrent list under the Government of India Act, 1935<sup>58</sup> and was carried forward in the Concurrent List in our Constitution by the Constituent Assembly. Exercising the aforementioned powers under the constitution the Parliament and Legislature of States have enacted several legislation for the regulation and administration of Electricity sector, it passed the Electricity (Supply) Act, 1948 after independence which covered the whole field relating to electricity.

The Supreme Court recognised electricity as fundamental right under article 21 and article 19 (1)(e) as a part of right to shelter. The court observed -

“Right to live guaranteed in any civilised society implies the right to food, water, decent environment, education, medical care and shelter. These are basic human rights known to any civilised society. All civil, political, social and cultural rights enshrined in the Universal Declaration of Human Rights and Convention or under the Constitution of India cannot be exercised without these basic human rights. Shelter for a human being, therefore, is not a mere protection of his life and limb. It is home where he has opportunities to grow physically, mentally, intellectually and spiritually. Right to shelter, therefore, includes adequate living space, safe and decent structure, clean and decent surroundings, sufficient light, pure air and water, electricity, sanitation and other civic amenities like roads etc. so as to have easy access to his daily avocation.”<sup>59</sup>

The High Court of Calcutta in the case of P. Madhava Rao v. Superintending Engineer And Ors.<sup>60</sup> observed-

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<sup>54</sup> Sch. VII List II Entry – 17.

<sup>55</sup> Sch. VII List I Entry – 6.

<sup>56</sup> Sch. VII List I Entry – 54.

<sup>57</sup> Supra note 46, Sch. VII List III Entry- 38.

<sup>58</sup> Government of India Act, 1935, Sch. VII List III Entry 31.

<sup>59</sup> Chameli Singh & Ors. v. State of U.P., (1996)2 SCC 549.

<sup>60</sup> 2006 SCC OnLine Cal 496.

“Electricity, in modern day is essential. It is integral part of one's life. Right to life has been recognized in our Constitution. But it is not merely one of living, but the quality of life. Further it is not out of place to mention that Section 43 of the Electricity Act, 2003 envisages that every distribution licensee shall on an application by the owner or occupier of any premises provide supply to such premises within a month.”

The High Court of Judicature, Madras in *T.M.Prakash v. The District Collector, Tiruvannamalai District*<sup>61</sup> interpreted sec. 43 of the Electricity act as compulsory supply of electricity and held that-

“In Section 43 of the Electricity Act, the word "shall" is used. Applying the principles of law to the Electricity Act, Distribution and Supply Codes, as regards supply of electricity, from the language employed in Section 43 of the Act, ie., duty to supply electricity on request and Section 44 of the Act, ie., exceptions from discharging the duty to supply electricity, which states that nothing contained in Section 43 shall be taken as requiring a distribution licensee to give supply of electricity to any premises, if he is prevented from so doing by cyclone, floods, storms or other occurrences beyond his control, it could be concluded that there is a statutory obligation to provide electricity to a owner or occupier of the premises.”

The court further associated electricity with fundamental right and held that – “When right to education upto the age of 14 years is a fundamental right, when right to health is also recognised as a right to life, under Article 21 of the Constitution of India, access to electricity supply should also be considered as a right to life, in terms of Article 21 of the Constitution of India.”

The Supreme Court in *G.Sundarrajan v. Union Of India*<sup>62</sup> held that a balance has to be struck between the fundamental right (right to life, safety and environment protection) and economic development. The court observed-

“Electricity is the heart and soul of modern life, a life meant not for the rich and famous alone but also for the poor and down trodden. They should also have an adequate means of livelihood, job opportunities for which we have to set up Industries and commercial undertakings in the public as well as private sector and also have to invite foreign

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<sup>61</sup> 2013(6)CTC 849.

<sup>62</sup> (2013) 6 SCC 620.

investment. Generation of electricity is of extreme importance for their establishment and functioning and also for domestic consumption.”

Conflicts and disagreements are bound to happen when there are two parallel agencies working simultaneously<sup>63</sup> and also when same kind of powers are vested with them<sup>64</sup>. The constitution provides for solution in limiting the powers of these agencies. Article 256 of the constitution provide that the executive power of the State shall be exercised in such a manner that it is within the limits prescribed by the laws of that State and should also not violate any law made by the Parliament and the Union executive is to exercise its power within the constitutional framework.

The exercise of concurrent jurisdiction by the Centre would not deprive the State Legislature of similar powers under the Concurrent List. The Union has absolute power to regulate matters enumerated under List I and States have absolute power to deliberate upon matters in List II; repugnancy would arise only when the Parliament and the State Legislature legislate under an entry in the Concurrent List, exercising their powers over the same subject-matter or whether the laws enacted by Parliament were intended to be exhaustive so as to cover the entire field.<sup>65</sup> Further, repugnancy must exist as a fact and not as a mere possibility and such existence is an essential pre-requisite for it. In case of repugnancy between laws made by the Legislature of a State and any provision of a law made by Parliament which Parliament is competent to enact, or to any provision of an existing law with respect to one of the matters enumerated in the Concurrent List, then, the law made by Parliament, whether passed before or after the law made by the Legislature of such State, shall prevail. The repugnant provision of the law made by Legislature of State can be made applicable by assent of the President.

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<sup>63</sup> Association Of Natural Gas v. Union Of India, (2004) 4 SCC 489 – where St. of Gujarat passed a legislation deliberating upon Natural Gas on the basis of Entry 25 (Gas & gas-works) but the court held the legislation ultra vires as it was a subject matter of union list under Entry- 53 (Petroleum & petroleum product).

<sup>64</sup> Tilak Ramji v. State of U.P., AIR 1956 SC 676.

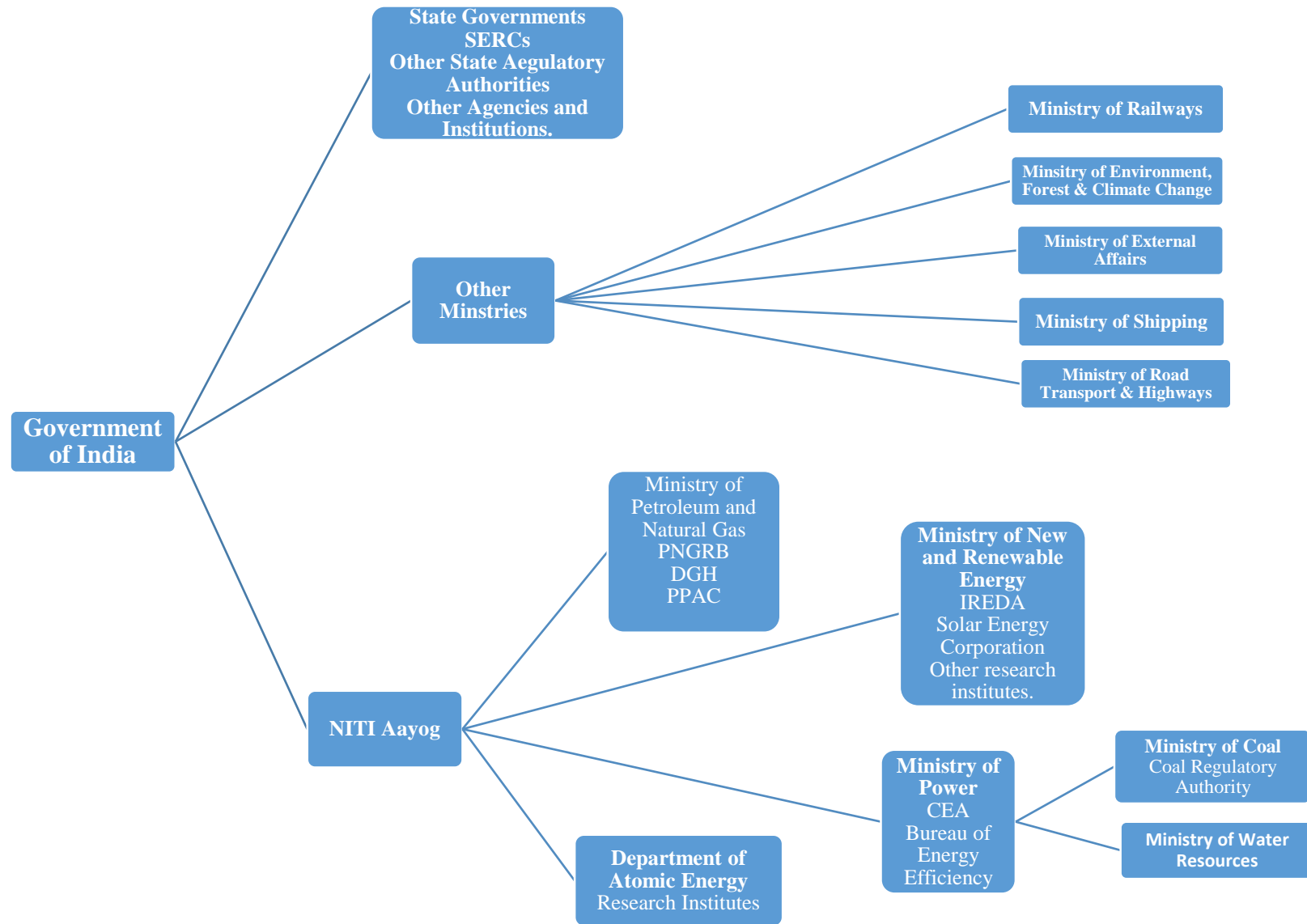
<sup>65</sup> Id.

### 2.3 Governance in Energy Sector

Prior to 1991, the electricity was a government monopoly. The Economic reforms of 1991 brought in deregulation and privatization in the sector. The participation of the private sector called for the creation of a neutral regulator and separation of the regulatory and operational functions of the government in the sector.

India being a federation has a built-in coordination mechanism between the Centre and the States. The Central government and the State governments co-ordinate with each other, through -the National Development Council, the Finance Commission, and interaction with the NITI Aayog (on the size of different development plans and central support to the state government). Coordination among ministries in a government is through Cabinet meetings and by the Chief or Prime Ministers. Further, frequent meetings between Ministerial departments take place to achieve coordination. However, due to the structure of hierarchy in a federal state and departmentalization of subject matters both at Central and State level, the coordination has been weak and in key areas it has been time-consuming and infructuous. In the Energy sector as well especially in the field of electricity (a subject matter of Concurrent list) development has taken place at a much lower pace than it ought to have due to lack of proper co-ordination. Coordination between the Centre and the States in electricity was for long erratic and inadequate until the introduction of the Accelerated Power Reforms and Development Programme (APRDP); it helped in introducing a programme with substantial rewards and penalties and with milestones for achievement.

The Ministry of Power and is primarily responsible for development of electrical energy in the country. The responsibility for different sources of energy, its generation, supply and distribution, and regulation is distributed among number of different Ministries such as Ministry of New and Renewable Energy (MNRE), Ministry of Petroleum and Natural Gas (MoPNG), Ministry of Coal, Ministry of Water Resources and Department of Atomic Energy (DAE). The functioning of Ministry of Power is closely dependent upon Ministry of Finance and for conduction operations the approval form the Ministry of Environment, Forest and Climate Change (MoEFCC) is necessary. NITI Aayog plays an important role in co-ordinating these ministries and keeping the policies applicable to different areas consistent with each other.





The above chart shows the organization structure of the country in the energy sector. The Ministry of Power is primarily responsible for all matters relating to hydro-electric power and thermal power and transmission and distribution system.<sup>66</sup> MNRE regulates and operates generation of Wind power, Bio-power, small Hydro Power and Solar Power<sup>67</sup> while DAE has been engaged in the development of nuclear power technology<sup>68</sup>. The State electricity Ministries control the government owned enterprises that own and operate most of the generation, transmission and distribution in the State since electricity is a concurrent subject.

Environmental clearances add substantially to power project costs for generation and transmission. Delays in clearances lead to time and cost overruns. There is little or no coordination between the different sectors. Nor is the Power Regulator required to enforce orders of government departmental environmental Regulators on matters such as pollution standards or fly ash utilization.

Similarly railway freight is an important cost element in coal prices and has been rising, thus affecting power costs. However the Power Regulator has no say in such freight increases. On the other hand, railways pay the highest costs for power as compared to other consumers.

Government decision-making on energy at the Central level is distributed between the Ministry of Petroleum and Natural Gas, the Ministry of Coal, the Ministry of Non-Conventional Energy Sources, the Ministry of Environment and Forests, the Ministry of Atomic Energy, and the Ministry of Power. Within the Ministry of Power, the Central Electricity Authority (CEA, the technical wing) works closely with individual State electricity boards (SEBs) and utilities in power generation, transmission, and distribution of electricity. At the State level, there exist various departments, agencies and authorities working on various sub-sectors of energy. Ironically, the Panchayati Raj functioning at the village level does not have at present any role to play in rural electrification. The responsibility for comprehensive rural electrification (including quality of power and collection) is scattered between different Ministries in an uncoordinated fashion.

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<sup>66</sup> Ministry of Power, <http://powermin.nic.in/content/responsibilities> (last visited June 17, 2016).

<sup>67</sup> Ministry of New and Renewable Energy, <http://mnre.gov.in/schemes/grid-connected/> (last visited June 17, 2016).

<sup>68</sup> Department of Atomic Energy, <http://dae.nic.in/?q=node/634> (last visited June 17, 2016).

Being a concurrent subject under the Constitution the States share powers with the Centre only on power, not on the other energy sources. However they do share powers on environmental regulation. This distribution of powers makes coordination between the different energy sources, over the country and between States difficult. Lack of Coordination between the Power Ministry and the others related Ministries and between the state departments creates difficulties and affect the overall growth and development of Energy sector.

After the end of government monopoly in the energy sector (In Economic reform of 1991 the government deregularised the economy and opened the market for private entities) government has made attempts to change its governance policy. In the recent times the government has taken steps especially in the energy sector to remodel the governance structure by appointing regulatory agencies, and refraining itself from actively participating in the governance of the sector. Among Energy sectors Electricity sector at present has one of the most extensively defined independent regulatory mechanism (covering licensing, trading, tariffs, transmission and distribution), having separate body at the Centre (CERC) and separate bodies for States (SERCs). The CERC regulates entities owned by the Central government, inter State issues, adjudicates upon disputes arising in the sector and also advises the government in policy making<sup>69</sup>; the SERC is responsible for matters within a State<sup>70</sup>. In the area of thermal power which is mostly dependent on coal the government proposed to form a regulator under the Coal Regulatory Authority Bill, 2013 but the bill lapsed due the dissolution of Parliament in 2014. The Ministry has constituted Coal Regulatory Authority under the overall administrative control of Ministry of Coal<sup>71</sup> and the government has proposed to re-introduce the bill in the parliament.<sup>72</sup> The government has also passed the Petroleum and Natural Gas Regulatory Board Act, 2006 appointing an independent regulatory body PNGRB for the Petroleum and Natural Gas Sector. The government has taken several steps to improve the governance policy of the sector for proper regulation and private participation but there is still scope for improvement in the governance structure

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<sup>69</sup> Electricity Act, 2003, s. 79.

<sup>70</sup> Ibid., s. 82.

<sup>71</sup> Ministry of Coal, Resolution (March 4, 2014), [http://coal.nic.in/sites/upload\\_files/coal/files/curentnotices/not250314\\_0\\_0.pdf](http://coal.nic.in/sites/upload_files/coal/files/curentnotices/not250314_0_0.pdf).

<sup>72</sup> Independent Regulator for Coal Sector, Press Information Bureau, GoI, Ministry of Coal, <http://pib.nic.in/newsite/PrintRelease.aspx?relid=119748>.

for easing the functioning of the sector and for quick and proper implementation of Rules and Policies made by the government.

#### **2.4 Government Institutions:**

The CERC and SERCs established under the Electricity Act, 2003 are the major regulatory institutions which regulate the electricity sector in India. Apart from these regulatory authorities, in order to promote investment and technological innovation in the renewable energy sector the Central Government has set up several institutions to incentivize and promote renewable energy sector. There are several institutions constituted under the Ministry to facilitate research in different segments of renewable resources and also to train persons in the field of renewable in order to provide skilled manpower to the sector.

#### **Solar Energy Corporation of India (SECI)**

The Solar Energy Corporation of India (SECI), is the only central PSU dedicated exclusively for the solar energy sector. It is under the administrative control of the MNRE and registered under Section 25 (not-for profit co.) of Companies Act, 1956. SECI is responsible for implementation of schemes introduced MNRE and it invests in the solar energy sector on behalf of the government. The Government of India recently approved of conversion of the company form not-for-profit to a company registered under sec. 3 of the Companies Act, 2013 and renamed it as Renewable Energy Corporation of India (RECI).<sup>73</sup> This change has made the corporation self-sustaining and not be dependent on the government for funds. It allows the corporation to actively produce and invest in the sector and generate profit. The said notification has broadened its area of conduct to all segments of renewable energy all the corporation to convene its business in all areas of renewable energy.

Recent developments have broadened the scope of SECI and now it extends to all segments of renewables. It is now allowed to commence business in the sector and

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<sup>73</sup> PIB, GoI, Conversion of Solar Energy Corporation of India from Section 8 company to Section 3 company under the Companies Act, 2013 and renaming it as Renewable Energy Corporation of India (June 24, 2015), <http://pib.nic.in/newsite/pmreleases.aspx?mincode=61>.

generate profits for itself. The corporation generated revenue of approximately 400 crores in 2014-15<sup>74</sup> and is expected to generate more in future.

### **Indian Renewable Energy Development Agency (IREDA)**

The Indian Renewable Energy Development Agency (IREDA), is a Non-Banking Financial Institution which under the administrative control of MNRE for providing term loans for renewable energy and energy efficiency projects. It was established in 1987 with the motto “Energy for Ever” for promoting, developing and extending financial assistance for setting up projects relating to new and renewable sources of energy. It arranges its resources through lines of credit and market borrowing from bilateral and multilateral lending institutes such as the Asian Development Bank (ADB), World Bank, the Nordic Investment Bank, Japan International Cooperation Agency, the French development agency AFD, and the German development bank KfW. A number of incentive schemes of MNRE are administered through IREDA. Recent developments suggest that the government plans convert the institution into a Green Bank<sup>75</sup> which will entitle the institution of many privileges which the institution is currently not able to avail.<sup>76</sup>

### **Solar Energy Centre (SEC)**

The Solar Energy Centre (SEC), established in 1982, is a dedicated unit of the Ministry of New and Renewable Energy, Government of India for development and innovation in solar energy technologies, and its related science & engineering. To achieve this target, the Centre has been working on various aspects of solar resource utilization and technology development in collaboration with other research institutions, industries and implementing agencies. Over the years, the Centre has developed a variety of technical

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<sup>74</sup> SECI, 4<sup>th</sup> Annual Report, 2014- 15, 54

[http://www.seci.gov.in/upload/uploadfiles/files/1%20\(5%20files%20merged\)%20\(1\).pdf](http://www.seci.gov.in/upload/uploadfiles/files/1%20(5%20files%20merged)%20(1).pdf).

<sup>75</sup> A public or quasi-public financing institution that provides low-cost, long-term financing support to clean, low-carbon projects by leveraging public funds through the use of various financial mechanisms to attract private investment.

<sup>76</sup> *IREDA may be converted into a Green Bank*, The Economic Times, May 04, 2015, [http://economictimes.indiatimes.com/articleshow/52111096.cms?utm\\_source=contentofinterest&utm\\_medium=text&utm\\_campaign=cppst](http://economictimes.indiatimes.com/articleshow/52111096.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst).

facilities for validation and technology evaluation, standardization and testing, performance reliability, data analysis and monitoring apart from training.

### **National Institute of Solar Energy (NISE)**

National Institute of Solar Energy (NISE), was constituted converting Solar Energy Centre (SEC) under MNRE as an autonomous institution in September, 2013 to assist the Ministry in implementing the National Solar Mission and to coordinate research, technology, skill development, training, consultancy, incubation and other related works. NISE is the apex National R&D institution in the field Solar Energy.

### **Sardar Swaran Singh National Institute of Renewable Energy (SSS-NIRE)**

Sardar Swaran Singh National Institute of Renewable Energy (SSS-NIRE), was established by the government as an autonomous Institution under the Ministry of New and Renewable Energy for R&D in biomass segment. The objectives of the Institute is to carry out and facilitate research, design, development, testing, standardization & technology demonstration eventually leading to commercialization of R&D output with a focus on bioenergy, biofuels & synthetic fuels in solid, liquid & gaseous forms for transportation, portable & stationary applications, development of hybrid / integrated energy systems, to undertake & facilitate human resource development and training in the area of bioenergy.

### **Centre for Wind Energy Technology (C-WET)**

A Centre for Wind Energy Technology (C-WET), was established in 1998 as an R&D institution, the administrative control of which was handled by the Ministry of New and Renewable Energy (MNRE). It is a knowledge-based institution of high quality and dedication, offers services and seeks to find complete solutions for the kinds of difficulties and improvements in the entire spectrum of the wind energy sector by carrying out further research. It has a Wind Turbine Test Station (WTTS) at Kayathar with the technical & partial financial support by DANIDA, Govt. of Denmark. Located in Chennai, Tamil Nadu and serves as the technical focal point for wind power

development. The name of the institution was later converted to National Institute of Wind Energy.

### **Alternate Hydro Energy Centre (AHEC)**

Alternate Hydro Energy Centre (AHEC) was established in Indian Institute of Technology, Roorkee, with an initial sponsorship of Ministry of Non-Conventional Energy Sources in the year 1982. The mandate of the center was to promote power generation through the development of Small Hydropower projects (SHP) in hilly as well as plain areas & development of de-centralized integrated energy systems in conjunction with other renewable energy sources e.g. biomass, solar, wind etc. The center undertakes the investigation, detailed project reports, engineering designs, techno-economic analysis, field execution of small hydro projects, refurbishment of old and existing small hydropower houses and development of biomass and solar energy systems. The centre carries out the environment and energy auditing of process and allied industries and EIA of small hydro projects. The Centre has also worked for several projects related the conservation and management of water bodies. Technical support to over 20 different state and central government organizations for SHP development has been provided. Few IPPs and financial institutions have used its expertise support for their SHP development.

There are several important government units like the CEA, the Power Finance Corporation (PFC), the PTC India Ltd., and the Rural Electrification Corporation falling under the purview of Ministry of Power which are related to renewable energy sector.

The **Central Electrical Authority's** task is to develop a suitable energy policy for India and conduct planning and coordination tasks. It also completes the preliminary analysis for MoP on technical and economic issues<sup>77</sup>.

**Power Finance Corporation Ltd.** is responsible for tapping new sources of finance for investments in power projects in the public and private sectors<sup>78</sup>.

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<sup>77</sup> Central Electrical Authority, <http://www.cea.nic.in//>, (last visited July 19, 2016).

<sup>78</sup> Power Finance Corporation, <http://www.pfc.gov.in//>, (last visited July 19, 2016).

PTC India Ltd., formerly known as **Power Trading Corporation of India Limited**, was established in 1999 with a mandate to optimally utilize the existing resources to develop a full-fledged, efficient, and competitive power market to attract private investment in the Indian power sector and to encourage the trade of power with neighboring countries<sup>79</sup>.

The **Rural Electrification Corporation Ltd**, established in 1969, is responsible for the financial support of all rural electrification programs including the large-scale *Rajiv Gandhi Grameen Vidyutikaran Yojana* (RGGVY), which aims to extend electricity to all rural households and households below the poverty line<sup>80</sup>.

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<sup>79</sup> PTC India Ltd., <http://www.ptcindia.com/>, (last visited July 19, 2016).

<sup>80</sup> Rural Electrification Corporation Ltd., <http://www.recindia.nic.in/>, (last visited July 19, 2016).

## **CHAPTER 3**

### **ANALYSIS OF LAWS AND POLICIES FOR RENEWABLE ENERGY**

Prior to the Electricity Act of 2003, the power sector in India was governed by three important legislations viz. The Indian Electricity Act, (1910) the Electricity (Supply) Act, 1948 and the Electricity Regulatory Commission (ERC) Act, 1998.

The Electricity (Supply) Act, 1948 introduced monopoly in generation, transmission and distribution in the country, except in Bombay, Surat, Kolkata and Ahmedabad. The purpose of the act was to achieve uniform regional development of the sector and development of a Grid system. It promoted state-owned vertically integrated structure in the electricity sector by creating state electricity boards (SEBs) which would act as a technical advisor to the State Government and regulate the sector at state level. The Act also created a Central Electricity Authority (CEA) for technical advice to the central government. Through this law, the licensee businesses were nationalized by the SEBs which became responsible for generation, transmission and distribution. As the state fully owned the SEBs, they started attending to the political cause rather than the elementary principles of industrial entity. Consequently, they started incurring heavy losses in transacting their businesses. The financial loss made the government to re-strategies the functioning of SEBs on the line of international practice by unbundling generation, transmission and distribution activities. During this period, the government again opened up the generation sector to the private players.

Another major step in the reform of the electricity sector was the enactment of Electricity Regulation Commissions Act, 1998 which provided for creation of Central Electricity Regulation Commissions (CERC) at the Central Level for regulating tariff for the generating companies under the central government, inter-state sale and transmission and advice central government on formulation of tariff policy; and State Electricity Commission at state level to determine tariff for electricity at state level, regulate power purchase and procurement process, and other functions as the state may notify. Later, the electricity sector underwent complete overhaul on legislative front with the enactment of a new law in the year 2003.



### 3.1 The Electricity Act, 2003

The Electricity Act, 2003 is an Act of the Parliament of India (replaced the Electricity Act, 1910, the Electricity (Supply) Act, 1948 and the Electricity Regulatory Commissions Act, 1998) enacted to transform the power sector in India which covers major issues involving generation, distribution, transmission and trading in power. The Act entrusted the responsibility on the Government of India to prepare the National Electricity Policy and Tariff Policy<sup>81</sup>, and constitute policies on rural areas and non-conventional energy source,<sup>82</sup> in consultation with the State Governments and the Central Electricity Authority (CEA) for development of the power system based on optimal utilization of resources such as coal, natural gas, nuclear substances or materials, hydro, and renewable sources of energy. The restructuring of the SEBs resulted into separate generation, transmission and distribution entities. The separate identity took away the monopoly status of the Boards.

The Electricity Act, 2003 stipulated license free thermal generation<sup>83</sup>, non-discriminatory open access of the transmission system, gradual implementation of open access in the distribution system to pave way for creation of power market in India and encouragement of private sector participation in generation, transmission and distribution with the role of the governments being relegated to facilitator in nature. The Act opened up the sector for private players with the objective to promote competition and welfare of consumers.

The Act has put in place a highly liberal framework for generation. The requirement of techno-economic clearance from CEA for thermal generation project is no longer in existence. For hydroelectric generation as well, the limit of capital expenditure, above which approval of CEA is required, has been substantially raised from the present level<sup>84</sup>. Captive generation has been made free from all regulations.<sup>85</sup> The Act promotes rural electrification by removing the mandate of licence if a person intends to generate

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<sup>81</sup> Electricity Act, 2003, sec. 3, <http://www.cercind.gov.in/Act-with-amendment.pdf>.

<sup>82</sup> *Ibid.* sec. 4.

<sup>83</sup> *Supra* Note 73, sec. 7.

<sup>84</sup> *Supra* Note 73, sec. 7.

<sup>85</sup> *Supra* Note 73, sec. 9.

and distribute power in rural area<sup>86</sup> and creating a joint responsibility of the Central and State government for rural electrification<sup>87</sup>. The Act also incorporates provisions regarding Consumer protection, Market development, and has made changes in the regulatory framework.

The Act primarily deals with the electricity generated through conventional sources. The objective to liberalize and de-regulate the electricity sector was the driving agenda for the legislation of 2003. Therefore, it does not deal in elaborative manner on renewable sources of energy.

The Act imposes the responsibility upon central government to prepare a policy at the national level with the aim to augment power market by exploiting all kinds of resources available for the generation of electricity.<sup>88</sup> For our purpose, the section focuses on different sources, inter alia, renewable sources of energy. The policy emphasizes on the pooling in the cleaner source of energy in the energy industry. The policy has been dealt in detail in the later part of the chapter. The Act also allows the central government to notify the policy wherein stand-alone power system may be institutionalized in rural areas.<sup>89</sup> The policy advocates the premise that the strength of renewables should be utilized in order to cover up the scarcity of electricity, particularly in rural areas. The Act stipulates integration of electricity sector by promoting co-generation and generation of electricity from cleaner source of energy.<sup>90</sup> The provision is very visionary in nature. It will encourage the private players to participate in the generation of electricity from renewables and contribute to energy security in the country.

Further, the Electricity Act of 2003 has made it mandatory for SERCs to promote cogeneration and generation of electricity through renewable sources.<sup>91</sup>The section

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<sup>86</sup> *Supra* Note 73, sec. 14.

<sup>87</sup> *Supra* Note 14, sec. 6.

<sup>88</sup> *Supra* Note 14, sec. 3(1) - The Central Government shall from time to time, prepare the National Electricity Policy and tariff policy, in consultation with the State Governments and the Authority for development of the power system based on optimal utilization of resources such as coal, natural gas, nuclear substances or materials, hydro and renewable sources of energy.

<sup>89</sup> *Supra* Note 14, sec. 4 - The Central Government shall, after consultation with State Governments, prepare and notify a national policy, permitting stand alone systems (including those based on renewable sources of energy and other non-conventional sources of energy) for rural areas.

<sup>90</sup> *Supra* Note 14, sec. 61(h) - 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 promotion of co-generation and generation of electricity from renewable sources of energy.

<sup>91</sup> *Supra* Note 14, sec. 86(1)(e)-

focuses the integration of renewable energy by allowing grid connectivity with the conventional sources of energy. It attempts to diminish the differentiation between different sources of energy. Also, it allows the government to adopt suitable measures to promote the participation of renewables in the electricity market because the technological requirement for this category is more advanced than the coal/gas based electricity. In order to ensure the viability and sustainability of the players engaged in the generation of electricity from renewables, the section provides for the regulation relating to the mandatory purchase of electricity from this source of energy.

### 3.2 Government Policies and Initiatives:

#### The Integrated Energy Policy<sup>92</sup> (2004)

This policy has been linked primarily with sustainable development goals of the country. The Prime Minister and the Deputy Chairman, Planning Commission, Government of India, took the decision for an effective and comprehensive energy policy as an urgent imperative in the year 2004. The draft of integrated energy policy was circulated in December 2005 and the final policy was notified in August 2006. The broad vision behind the energy policy is to reliably meet the demand for energy services of all sectors including the lifeline energy needs of vulnerable households, in all parts of the country with safe and convenient energy at the least cost in a technically efficient, economically viable and environmentally sustainable manner. The integrated energy policy has outlined some ambitious tenets. These are summarized below. Renewable energy may need special policies to encourage them. This should be done for a well-defined period or up to a well-defined limit and should be done in a way that encourages outcomes and not just outlays.<sup>93</sup>

- Phase out capital subsidies, which only encourage investment without ensuing outcome, by the end of the 10th Plan linked to creation of renewable grid power capacity
- Power regulators must seek alternative incentive structures that encourage utilities to integrate wind, small hydro, cogeneration, etc., into their systems. All incentives must be linked to energy generated as opposed to capacity created.

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<sup>92</sup> An expert committee was constituted on 12th August 2004 under the leadership of Dr. Kirit Parekh, to prepare an integrated energy policy linked with sustainable development that covers all sources of energy and addresses all aspects including energy security, access and availability, affordability and pricing, efficiency and environment.

<sup>93</sup> Mahesh C Vipradas, *Case Study: Development of Regulatory Framework for Renewable Power in India*

- Respective power regulators should mandate feed-in laws for renewable energy, where appropriate, as provided under the Electricity Act and as are mandated in many countries.

The following specific policies to promote various renewable have been recommended in the policy:<sup>94</sup>

- *Mini Hydro:* A detailed survey should be carried out to identify potential sites. Identified sites should be auctioned. For plants which are not connected to grid bid for lowest tariff with a pre-specified premium in the form of Tradable Tax Rebate Certificates (TTRC) should be invited. For village level plants, the entrepreneurs should be encouraged to supply power to meet other requirements such as agro processing and milling. If the plant can feed into a grid, the grid should be required to accept power at the going time of day tariff, and the plant site should be auctioned off for minimum premium in the form of TTRC linked to output. The responsibility for investments for connecting to the grid should be fixed in advance before the bidding.
- *Wind Power:* For wind power, site selection is freer than hydro-power and wind plants can be set-up on private land. Thus there may be need to auction only sites on public property. The same two types of auctions may be followed as described above for hydro-power plants.
- *Fuel-wood Plantation:* Cooperatives should be encouraged and facilitated to grow tree plantations in villages. Cooperatives which are open to all members of the community and which are non-discriminatory should be given government land on long-term lease. Women should be encouraged to set-up and manage such plantations so that the time they now spend in gathering fuel can be spent productively in a way that empowers them. They should also be provided finance. If organized and managed properly, such plantations are economic and successful. Field based NGOs could also be involved in this activity. To encourage large-scale plantations, contract farming should be facilitated.

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<sup>94</sup> Ibid.

- *Electricity from Wood Gasification:* This can provide electricity based on gasification of wood and can be very useful especially in remote villages. The same set of policies, indicated for micro hydel and wind power plants should be followed here<sup>95</sup>.

### **National Electricity Policy (2005)**

After the enactment of Electricity Act, 2003, in pursuance of the provisions of section 3 of the Act, the Government of India notified its first National Electricity Policy<sup>96</sup>. The Policy aims at laying guidelines for accelerated development of the power sector, providing supply of electricity to all areas and protecting interests of consumers and other stakeholders keeping in view availability of energy resources, technology available to exploit these resources, economics of generation using different resources, and energy security issues. The National Electricity Policy has been evolved in consultation with and taking into account views of the State Governments, Central Electricity Authority (CEA), Central Electricity Regulatory Commission (CERC) and other stakeholders.<sup>97</sup>

The policy emphasizes on promotion of generation of energy through renewable energy sources and lay much emphasis on reduction in cost of establishing such units by promoting healthy competition and by incentivizing the sector.<sup>98</sup> It also recommends for renewable purchase obligation and cogeneration.<sup>99</sup> The policy emphasises on exploitation of small hydro, wind and bio-mass energy in order to create additional power generation capacity of the country and to increase the overall share of renewable

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<sup>95</sup> Priyanka Sharma, *Scope of Competition in Renewable Energy Sector in India*, Competition Commission in India (January 2012).

<sup>96</sup> MOP, Notification No. 23/40/2004-R&R (Vol-II) (February 12, 2005), available at <http://www.derc.gov.in/ActsPolicies/ActsPoliciesfiles/National%20Electricity%20Policy.pdf>.

<sup>97</sup> *Ibid.*, at 96.

<sup>98</sup> *Supra* note 96, at 5.12.1 Non-conventional sources of energy being the most environment friendly there is an urgent need to promote generation of electricity based on such sources of energy. For this purpose, efforts need to be made to reduce the capital cost of projects based on non-conventional and renewable sources of energy. Cost of energy can also be reduced by promoting competition within such projects. At the same time, adequate promotional measures would also have to be taken for development of technologies and a sustained growth of these sources.

<sup>99</sup> *Supra* note 96, at 5.12.2 Obligation to purchase of certain % of electricity from renewable sources by state. 5.12.3 Industries in which both process heat and electricity are needed are well suited for cogeneration of electricity. A significant potential for cogeneration exists in the country, particularly in the sugar industry. SERCs may promote arrangements between the co-generator and the concerned distribution licensee for purchase of surplus power from such plants. Cogeneration system also needs to be encouraged in the overall interest of energy efficiency and also grid stability.

energy sources in the electricity mix.<sup>100</sup> The Hydroelectricity being a clean and renewable source of energy has also been emphasised for power generation. Full development of the feasible hydro potentials in the country has been envisaged in the policy which will facilitate economic development of States, particularly North-Eastern States, Sikkim, Uttaranchal, Himachal Pradesh and J&K, since a large proportion of our hydro power potentials is located in these States.<sup>101</sup> Plans for long term Debt financing are provided by the Central Government taking into account the investment involved in such projects and State Governments are to review procedures for land acquisition, and other approvals/clearances for speedy implementation of hydroelectric projects.

The Policy also promotes setting up of captive power plants<sup>102</sup> with a view to securing reliable, quality and cost effective power and also to facilitate creation of employment opportunities through speedy and efficient growth of industry. The Policy promotes setting up of captive power plants by group of consumers enabling small and medium industries or other consumers that may not individually be in a position to set up plant of optimal size in a cost effective manner. The policy also embodies supply of surplus generation to the grid continuously or during certain time periods.

### **The National Tariff Policy (2006)**

The National tariff Policy was introduced by the government to ensure availability of electricity to the consumers at reasonable price and to make the sector financially viable and attractive for investment. The policy deals with the general approach to tariffs and lays down certain operating norms to be followed in order to improve efficiency and revisits parameters like renovation and modernization costs and talks (vaguely) about captive and renewable energy.<sup>103</sup>

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<sup>100</sup>Supra note 96, at 5.2.5.

<sup>101</sup> Supra note 96, at 5.2.6.

<sup>102</sup> Supra note 96, at 5.2.24.

<sup>103</sup> National Tariff Policy, 2006, sec. 6.4, [http://www.powermin.nic.in/whats\\_new/pdf/Tariff\\_Policy.pdf](http://www.powermin.nic.in/whats_new/pdf/Tariff_Policy.pdf)

### **National Electricity Plan (2007-2012)**

The National Electricity Plan was prepared by CEA under section 3(4) of the Electricity Act 2003 for the 11<sup>th</sup> five year plan. The plan helps prospective generating companies, transmission utilities and transmission/distribution licensees to use it as reference document. The plan was introduced with the aims to provide access to electricity (Available for all households in next five years), adequate availability of Power and supply of reliable and quality power of specified standards in an efficient manner and at reasonable rates.

Renewable energy sources have been considered while drawing up the capacity addition programme for the 12th and 13th Plans due to their inherent merits (sustainable and cause comparatively very little pollution) and the Policy provides for following –

- These sources are focused to meet the demands of remote locations where extension of grid may be difficult or very costly.
- Further, these sources could also be exploited for bridging the demand-supply gap especially in geographically dispersed areas.
- The capacity addition target for 11th Plan from renewable sources is 14,000 MW (not including solar capacity as proposed under the Solar Mission) During the 12th and 13th Plans, capacity addition is expected to be more than the 11th Plan capacity addition from renewable sources (18,700 MW and 31,000 MW respectively).

### **Jawaharlal Nehru National Solar Mission (JNNSM)**

The Jawaharlal Nehru National Solar Mission (JNNSM)<sup>104</sup> was launched in 11<sup>th</sup> January, 2010 by the Prime Minister. The Mission has set the ambitious target of deploying 20,000 MW of grid connected solar power by 2022 and is aimed at reducing the cost of solar power generation in the country through (i) long term policy; (ii) large

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<sup>104</sup> MNRE, Jawaharlal Nehru National Solar Mission, [http://www.mnre.gov.in/file-manager/UserFiles/mission\\_document\\_JNNSM.pdf](http://www.mnre.gov.in/file-manager/UserFiles/mission_document_JNNSM.pdf).



scale deployment goals; (iii) aggressive R&D; and (iv) domestic production of critical raw materials, components and products, as a result to achieve grid tariff parity by 2022. The mission was commissioned in three phases Phase I (2012-13), Phase II (2013-17), and Phase III (2017-22) and NVVN & SEIC were designated as the nodal agencies for solar thermal and PV technologies respectively. Phase I of the Mission focused on grid-connected projects and to achieve 500 MW of PV and 500 MW of solar thermal, which was a success story with 1142 MW of allotted capacity. Phase III targets of harnessing 20000 MW of grid connected power and 2000 MW off-grid solar application. The current undertaking Phase II<sup>105</sup> is targeted at 4000-10000 MW of grid connected power generation, 1000MW of rooftop project both off-grid and grid connected units and other off-grid installation in small scale. The Phase II is further divided into five batches with Batch-I having total capacity targeted at 750 MW from PV technology providing Viability Gap Funding (VGF) from National Clean Energy Fund (NCEF), Batch-II is to add Solar PV projects with a total capacity of 1500 MW under Bundling scheme with Thermal power as in Phase-I, Batch-III to add further a total solar PV capacity of 2000 MW under VGF scheme, Batch IV aims at Grid-connected Special Purpose Vehicle (SPV) projects for a cumulative capacity of at least 5000 MW to be set up on 'Build-Own-Operate' basis through Viability Gap Funding (VGF) mechanism, and Batch V aims at setting up of 1000 MW of grid connected solar PV projects by Central Public Sector Undertakings (CPSUs) and government organizations under various Central/State schemes with VGP.

Further the government has appointed four prominent institution (NCPRE, IIT Bombay; IEST, Kolkata; CEPT University, Ahmedabad; IIT Jodhpur) along with NISE for accelerate ongoing R&D efforts on different aspects of Solar Photovoltaic and Solar thermal technologies, including multi-disciplinary research, with the objective of improving the efficiency, systems performance and reducing the cost. A comprehensive policy for research & development has been put in place to achieve the objectives of cost reduction and efficiency enhancement.<sup>106</sup>

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<sup>105</sup> MNRE, Jawaharlal Nehru National Solar Mission, Phase II – Policy Document, <http://mnre.gov.in/file-manager/UserFiles/draft-jnnsmpd-2.pdf>.

<sup>106</sup> MNRE, Centre of Excellence in Solar Energy, <http://mnre.gov.in/file-manager/UserFiles/Center-of-Excellence-in-Solar-Energy.pdf>.

## Renewable Energy Certificate

The Electricity Act, 2003, the policies framed thereunder and, the National Action Plan on Climate Change (NAPCC) called for increasing the share of renewables in the total generation capacity in the country. Under the Electricity Act, 2003 certain pre-notified entities were obligated to generate or purchase a specified amount of their energy requirement from renewable energy sources. However, due to diverse topographical conditions in the country renewable energy sources are not evenly spread across the country. In some States the avenues for harnessing the renewable energy is comparatively more than other states and at the same time the high cost of generation from renewable energy sources discourages entities from purchasing renewable energy generation beyond the RPO level mandated by the State Commission. This acts as a deterrent to the companies generating power from renewable energy sources as they would not have prospective buyers in a state abundant with renewable energy resources and this would in turn lead to underutilization of renewable energy resources. Renewable Energy Certificates (REC)<sup>107</sup> attains significance in this context; it converts the energy produced in the form of certificate which can be easily procured by the obligate company. The program allows the State Electricity Boards to satisfy their legal obligation under the Electricity Act of 2003 to purchase a specified percentage of energy from renewable sources. The REC program has originated from the recognition that states, although equally obligated (legally) under the 2003 legislation, may not be endowed with equal capacity to purchase renewable energy. By issuing an REC, the government can ensure that entities are able to purchase renewable energy from facilities located outside the state and procure an REC as evidence of its having satisfied its legal obligation under the Electricity. REC helps the generating companies to convert their production into a marketable commodity which can be sold in the market;

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<sup>107</sup> According to US Environment Protection Agency -A renewable energy certificate, or REC is a market-based instrument that represents the property rights to the environmental, social and other non-power attributes of renewable electricity generation. RECs are issued when one megawatt-hour (MWh) of electricity is generated and delivered to the electricity grid from a renewable energy resource, available at <https://www.epa.gov/greenpower/renewable-energy-certificates-recs>. The concept is understood in the same manner in India as well. REC is treated as marketable instrument and equivalent to 1 MWh of energy produced from renewable sources, available at <https://www.recregistryindia.nic.in/index.php/general/publics/faqs>.

any obligated entity can purchase this certificate to fulfill their obligation. Through this concept energy generated from renewable energy sources was split into two components namely the 'Electricity Component' and the 'Green Attribute'. Cost of electricity generation from renewable energy sources was classified as cost of electricity generation equivalent to conventional energy sources and the cost for environmental attributes. The environmental attributes of such production was made available to be exchanged in the form of Renewable Energy Certificates (REC). Renewable Energy (RE) Generators were given the option to sell the energy generated under preferential Tariff or either under the REC Mechanism.

The Ministry of New and Renewable Energy proposed the creation of Renewable Energy Certificate program (REC) to make investing and purchase of renewable energy more cost effective.<sup>108</sup> CERC notified the framework for REC<sup>109</sup> to give a push to renewable energy capacity which allowed all grid connected renewable energy technologies approved by MNRE to be eligible for REC issue. The eligible entities shall apply to the Central Agency for Certificates within six months after corresponding generation from eligible renewable energy projects provided that the online application for issuance of certificates may be made on 10th /20th or last day of the month. The certificate issued to the entities enable them to easily trade their renewable credit for 3 year after the issue of certificate and at the same time allows obligated entities to fulfill their obligation by purchasing such certificates. CERC by exercising its powers under the said regulation designated National Load Dispatch Centre of Power System Corporation Ltd. (NLDC) as the Central Agency for the purpose of regulating REC mechanism.<sup>110</sup> Renewable Energy Certificate Registry of India was constituted by the CERC for regulation of REC regime and issue REC to eligible entities.

The REC process as per REC Registry India involves Accreditation, Registration, Issuance and Redemption. An application for availing accreditation may be made by

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<sup>108</sup> ABPS Infrastructure Advisory Private Limited, *Report on Development of Conceptual Framework for Renewable Energy Certificate Mechanism for India* 6 (2009), available at <http://www.mnes.nic.in/pdf/MNRE-RECReport.pdf>.

<sup>109</sup> CERC, CERC (Terms and Condition for Recognition and Issuance of Renewable Energy Certificate for Regulation Energy Generation Regulations, 2010 ) Regulation, 2010 (January 14, 2010), [http://cercind.gov.in/Regulations/CERC\\_Regulation\\_on\\_Renewable\\_Energy\\_Certificates\\_REC.pdf](http://cercind.gov.in/Regulations/CERC_Regulation_on_Renewable_Energy_Certificates_REC.pdf).

<sup>110</sup> The Gazette of India, CERC Notification, REGD. NO.D.L.- 33002/99, (January 29, 2010), [https://www.recregistryindia.nic.in/pdf/REC\\_Regulation/Gazette\\_Notification\\_for\\_designating\\_NLDC\\_as\\_Central\\_Agency.pdf](https://www.recregistryindia.nic.in/pdf/REC_Regulation/Gazette_Notification_for_designating_NLDC_as_Central_Agency.pdf).

the generating company to the State Agencies (as designated by the SERCs), which will look into eligibility conditions for participating in REC mechanism. The State Agency, after duly inspecting/verifying conditions, grants a 'Certificate for Accreditation' (valid for five years) to the concerned Applicant for the proposed RE Generation project. After accreditation, an application for availing registration is made by the RE Generator to the Central Agency, the Central Agency after duly inspecting/verifying conditions, grants 'Certificate for Registration' (valid for five years) to the concerned Applicant as 'Eligible Entity' confirming its entitlement to receive Renewable Energy Certificates for the proposed RE Generation project.

An application for issuance of Renewable Energy Certificate is made by the Eligible Entity to the Central Agency which includes Energy Injection Report duly certified by the concerned State Load Dispatch Centre. The Eligible Entity then may place for dealing the RECs, both 'Solar' and 'Non-Solar' Certificates, on any Power Exchange, where the trading in RECs takes place. Fees and charges for the REC Process have been specified by CERC as INR 45,000 for Accreditation, INR 7000 for Registration and INR 10 for issuance of one REC.

RECs are only allowed for single transfer and traded on two power exchanges, Indian Energy Exchange and Power Exchange of India Ltd. The price of Certificates are allowed to float as per the market demand, but only within the range of floor price and forbearance price set by the CERC. The current price range for RECs are

	Non-Solar REC (Rs/MWh)	Solar REC (Rs/MWh)
Forbearance Price	3300	13400
Floor Price	1500	9300

As of May 2016, the opening balance of RECs was 1,65,90,757 certificates and 6,87,577 were issued and only 2,12,035 were redeemed.<sup>111</sup> Though there is tremendous growth in the issuance of RECs over the last few years, but the data shows an increasing gap between RECs issued and those redeemed. If such back logs continue it will affect

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<sup>111</sup> Renewable Energy Certificate Registry of India, available at <https://www.recregistryindia.nic.in/>.

the cash flows of the RE project developers who won't be able to rely on them as a source of revenue.

A total of 1.63 lacs RECs were traded in the REC trading session held on 27<sup>th</sup> July, 2016 at the Indian Energy Exchange Limited (IEX) in New Delhi.<sup>112</sup> The market saw about 31% increase in trade over 1.25 lacs RECs traded in the same month last year. Clearing ratio in exchange for Non-Solar RECs stood at **1.91%** and **1.69 %** in IEX and PXIL respectively and for Solar RECs Clearing ratio stood good at **1.17%** and **0.97%** in IEX and PXIL respectively. IEX Director (Business Development) Rajesh K Mediratta said the inventory of RECs has been ever growing since the inception of the market as demand for them is fairly low.<sup>113</sup> Even after several attempts by the government the trading of these certificates on IEX and PXIL has remained sluggish. The main reason for lower demand is the lack of interest shown by obligated entities in meeting their RPO. The obligated entities under the mandate though obligated to fulfil their RPO are not bound by any sanction and interestingly the government aims to add 1,00,000 MW solar power capacity by 2022; the future of which looks bleak under the current regulatory regime. In the absence of any sanction on the obligated entities for not fulfilling their RPO mandate the future of REC market is solely dependent on how effectively SERCs enforce compliance of RPO.

### **National Policy on Biofuels**

This policy was introduced in 2015 with a vision of mainstreaming at biofuels technologies and for accelerated promotion and development of the production, cultivation, and use of biofuels as substitute to petrol and diesel. The policy aims at supply of minimum level of biofuels in the market to meet the demand with a target of 20% blending of biofuels (both for bio-diesel and bio-ethanol) by 2017. The strategy adopted by the policy is to focus on utilization of degraded forest land and non-forest land for production of biofuel. The Policy adopts a mechanism of plantation of trees

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<sup>112</sup> REC Trading Session: July 2016, IEX,

[http://www.iexindia.com/Uploads/NewsUpdate/27\\_07\\_2016PressReleaseIEXRECJuly16.pdf](http://www.iexindia.com/Uploads/NewsUpdate/27_07_2016PressReleaseIEXRECJuly16.pdf).

<sup>113</sup>Over 1 crore renewable energy certificates unsold at IEX , The Economic Times (Apr 05, 2015),

[http://economictimes.indiatimes.com/articleshow/46812493.cms?utm\\_source=contentofinterest&utm\\_medium=text&utm\\_campaign=cppst](http://economictimes.indiatimes.com/articleshow/46812493.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst).

bearing non-edible oilseeds, provide for extensive marketing and distribution policy and financing of biofuels projects. In addition it also provides for fiscal and financial incentives and demonstration of technologies for attracting investment.

### **International Collaboration**

Apart from taking several steps at the national level the government has taken several initiatives at International level as well, for the promotion of Renewable Energy as an alternative to conventional sources of energy and for the development of technology in the segment to make it cost efficient. The Indian Renewable Energy Programme has received increased recognition internationally and the government has entered into several Bilateral and Multilateral agreements<sup>114</sup>(establishing institutional relationship between the countries). Many countries evinced interest in cooperation with India for promotion of new and renewable energy by way of sharing technology, taking up joint R&D programmes, or by manufacturing of system/devices for both the countries. India's renewable energy sector has been ranked third in the Renewable Energy Country Attractiveness Index<sup>115</sup> and in order to attract large scale investments for the renewable energy sector, India organised its first Renewable Energy Global Investors Meet & Expo in 2015 and is planning to organize **Renewable Energy India Expo** in September 2016<sup>116</sup>.

India and the United States launched the **U.S.-India Partnership to Advance Clean Energy (PACE)** on November 24, 2009 under the U.S.-India Memorandum of Understanding to enhance cooperation on Energy Security, Energy Efficiency, Clean Energy and Climate Change. As a priority initiative under the PACE umbrella, the U.S. Department of Energy (DOE) and the Government of India signed an agreement to establish the Joint Clean Energy Research and Development Center (JCERDC) on November 4, 2010 which was designed to promote clean energy innovation by teams

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<sup>114</sup> MNRE, International Bilateral/Multilateral Cooperation Frameworks between India and other countries for cooperation in New and Renewable Energy, <http://mnre.gov.in/schemes/support-programmes/international-cooperation-3/> (last visited July 19, 2016).

<sup>115</sup> Renewable energy country attractiveness index, September 2015, [http://www.ey.com/Publication/vwLUAssets/RECAI-45-September-15-LR/\\$FILE/RECAI\\_45\\_Sept\\_15\\_LR.pdf](http://www.ey.com/Publication/vwLUAssets/RECAI-45-September-15-LR/$FILE/RECAI_45_Sept_15_LR.pdf).

<sup>116</sup> Renewable Energy India Expo, <http://www.renewableenergyindiaexpo.com/>.

of scientists and engineers from India and the United States (main focus being Solar energy, Biofuels, and Energy efficiency of buildings). After the 2015 meet the government decided to expand the programme and Solar Energy Research Institute for India and the United States (SERIUS) was constituted. The vision of the SERIUS, is to create an environment for cooperation and innovation “without borders” to develop and ready emerging and revolutionary solar electricity technologies toward the long-term success of India’s Jawaharlal Nehru National Solar Energy Mission and the U.S. DOE Sun Shot Initiative. The overall goal of SERIUS is to accelerate the development of solar electric technologies by lowering the cost per watt of photovoltaics (PV) and concentrated solar power (CSP) through a binational consortium that will innovate, discover, and ready emerging, disruptive, and revolutionary solar technologies that span the gap between fundamental science and applied R&D, leading to eventual deployment by sustainable industries.<sup>117</sup>

On January 25, 2016 The Prime Minister of India and the President of France, jointly laid the foundation stone of the **International Solar Alliance (ISA)** Headquarters and inaugurated the interim Secretariat of the ISA in National Institute of Solar Energy (NISE).<sup>118</sup> ISA’s vision is to provide a platform for cooperation among solar resource rich countries where global community including bilateral and multilateral organizations, corporates, industry, and stakeholders can make a positive contribution to the common goals of increasing utilizing of solar energy in meeting energy needs of ISA member countries in a safe, convenient, affordable, equitable and sustainable manner. With an objective to create collaborative platform for increased development of solar technologies, ISA will work in defined focus areas for development and growth of solar technologies in the world.<sup>119</sup>

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<sup>117</sup> Indo-U.S. Joint Clean Energy Research and Development Center, Status Report, September 2015, [http://www.iusstf.org/cms/newsimages/file/jcerdc/JCERDC\\_Status\\_Report\\_2015.pdf](http://www.iusstf.org/cms/newsimages/file/jcerdc/JCERDC_Status_Report_2015.pdf).

<sup>118</sup> Press Information Bureau, GoI, International Solar Alliance will be the First International and Inter-Governmental Organisation of 121 Countries to have Headquarters in India with United Nations as Strategic Partner, <http://pib.nic.in/newsite/PrintRelease.aspx?relid=135794> (last visited July 20, 2016).

<sup>119</sup> Working Paper on International Solar Alliance (ISA), 3-4, <http://mnre.gov.in/file-manager/UserFiles/ISA-Working-Paper.pdf>.

### 3.3 State Policies:

Weak policies and its improper implementation is one of the major hindrance for the development of renewable energy sector. In India every State has its own renewable energy policy which provide for several incentives in a very comprehensive manner. The States are empowered to make such policies under the constitution as well as under the National Electricity Policy. The States while using their discretionary power have implemented either a common policy<sup>120</sup> providing *modus operandi*, specifications and different incentives or have provided separate policies for each Solar<sup>121</sup>, Wind<sup>122</sup> and Biogas<sup>123</sup>.

The common policies for renewable energy implemented by the twelve States provide for incentives for development of all renewable energy resources and out of these twelve state policies only five policies have a comprehensive target to achieve in a fixed period of time and other policies have no fixed target to achieve. In Solar policies of different States (Annexure 2) almost all states have a set target to achieve (twelve states) but the case is not the same in Wind or Biogas policies where in the first instance very few states have implemented policies and none of the policies have any set target to be achieved. Lack of fixed target acts as a hindrance to the growth and development of the sector as there is absence of a motivating force for the government agencies to take active part in the development and establishment of new projects in the sector.

In Annexure 1 out of twelve common policies by different States only three States (Karnataka, Maharashtra and West Bengal) have provided for creation of a separate fund i.e. a Green Energy Fund or a Green Cess Fund for the investment in the sector. Apart from Karnataka, Maharashtra and West Bengal, state of Uttar Pradesh & Odisha has

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<sup>120</sup> Annexure 1.

<sup>121</sup> Annexure 2.

<sup>122</sup> Annexure 3.

<sup>123</sup> Annexure 4.



also called for a creation of a separate fund for investment in the renewable energy sector in their Solar Policies (Annexure 2). The Wind policies (Annexure 3) and Biogas Policies (Annexure 4) of States do not have any mention of creation of a separate fund in the sector. Creation of a separate fund from the total funds for the purpose of investment in the sector streamlines the funds and helps in accelerated growth of the Sector.

From the research conducted it can be clearly seen that approximately all State policies provide for 'Industry status' to all RE establishments and entities producing products ancillary to RE generation; and provide such entities with all such incentives which are available industrial units under their respective State Industrial Policies. Industrial Policies are the policy initiatives of the States to attract investment in the State and provide for several incentives which makes the investment in that State attractive for the investor; providing all the incentives available to industries to RE establishment creates a sense of equal treatment of RE establishment with other industries and makes the area attractive for the investor to invest. The State policies also provide for exemption from payment of electricity duty for the fixed period of time; or for the tenure of project or 25 years (whichever is earlier) which incentivises the production of RE by reducing cost of energy produced, such an incentive attracts investment by reducing the cost of production and at the same time simultaneously increasing the returns on investment. Most of the State policies also provide for banking of renewable energy produced for a period of 12 months. The policies either provide for free banking of energy or they charge for such banking facility with minimum charges either in cash or in kind. Most of the state policies provide for certain restrictions with regard to time of withdrawal of such banked energy taking into consideration the harvest season of that state, peak hours, shortage periods etc. Energy Banking facility attracts investment by removing the burden from the RE producer of storage of renewable energy produced as the produced energy can be supplied to the grid if it is not instantaneously needed and can be taken from the grid when there is demand for such energy.

The perusal of the annexures shows that several states provide for tax exemptions as well, as an incentive to promote development of renewable energy sector. States such as Bihar and Kerala exempt tax of machinery involved in the production of renewable energy and also exempt them from importation and exportation charges. The States like Jammu & Kashmir, Karnataka, and Mizoram provided exemption from entry tax

and development tax in their solar policies. The State of Haryana and Madhya Pradesh also provide for similar tax exemptions in their common policy (Annexure 1) and biofuel policy (Annexure 4) respectively. Several State policies (Manipur, Meghalaya, Mizoram, & Punjab) provide of VAT and Sale Tax exemption on renewable energy products and production from all sources (Annexure 1) while some state (Chhattisgarh, Jharkhand, MP, & Telangana) only provide it under their solar policy. Madhya Pradesh is the only state which provide for such incentives under its Wind policy. Such tax benefits attracts more investment as the investors are either waived off from paying such taxes or they are refunded the amount paid by them as requisite tax.

Wheeling and Transmission charges are the charges imposed on by the transmission utilities for the transport of energy form one place to another. Distribution losses are those loss in the quantity of energy which is cause in course of transmission and distribution process; such charges are also imposed by transmission or distribution utilities upon generating companies. Many States exempt all kinds of RE producers from payment of such charges (Karnataka, Kerala, Uttrakhand, Manipur and Meghalaya), while some provide for such exemption only in solar generation (Jharkhand, Mizoram), and some only provide it under generation through wind energy (Andhra Pradesh, Chhattisgarh). Madhya Pradesh for promoting development of generation of energy from wind and biofuel provide such incentive under its respective policy. Uttrakhand (for all RE sources), Haryana & Kerala (solar), and Andhra Pradesh (wind) provide for evacuation arrangements for utilities. Evacuation arrangements include all such requirements necessary for connecting the utility form the grid for evacuation of excess energy produced.

Availability of Land in ample quantity is a major requirement for generation of energy form RE sources and Indian with one of the most densely populated country in the world faces many hurdles in procurement of land for development of RE projects. Many States are hesitant to acquire land under the Land Acquisition law for RE projects due to the socio-economic factors attached to such acquisition. Very few States (9 States) provide for government land/ land acquisition for development of RE project and such land availability is subject to availability of land with the government.

First right of refusal is a method of incentivising the RE sector by purchase of energy produced by the concerned state government/ agency at the first instance and then sale

to other party on subsequent refusal. It is provided by only two states Karnataka and Uttarakhand for all renewable sources and by Chhattisgarh for energy generated from wind. Similarly, Feed-in tariff which inputs incentives in the RE sector by payment of certain fixed amount to the producer or household who is producing energy from renewable energy sources.

Letter of Credit to generating companies help them by increasing their borrowing power; states policies of Karnataka, Kerala, Punjab, & West Bengal (Annexure 1) provide for Letter of Credit to producers to enhance their borrowing power. Bihar facilitates the producers by granting loan to eligible producers. There are several other procedural incentives which are adopted by States with a view to incentivise the RE sector such as disposal of receipt and settlement of due within 30-60 days, non-requirement of environment clearance from the concerned State Pollution Control Board, deemed no-agricultural status of land used for RE projects, Public Private Partnership in RE projects, Power Purchase Agreement for a fixed period for procurement of renewable energy, and creation of land bank for making land available for RE projects.

Apart from policy issues, another major hurdle in the development of renewable energy sector is the implementation of these policies. Since, the policies are not legal requirements and do not attract sanction in case of non-compliance, mere issue of policies is not enough, its proper implementation in the targeted area is very essential for the real success of the policy. According to the CAG report of 2015 the Green Cess fund of Maharashtra was not utilised at all and the budgetary funds allocated to fund was not transferred leading to non-utilization of resources;<sup>124</sup> such non implementation of available policy measures makes the policy redundant.

The resilience of the sector against all odds showcases that renewable energy is indeed the future and will play a major role in providing a clean, secure and sustainable energy economy. The potential is unquestionably large and the rapidly growing economies are determined to transform the economic crisis into an opportunity for greener growth. But as of yet there is no overarching renewable energy law governing all states or any

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<sup>124</sup> Comptroller Auditor General, Report of the CAG on PSUs for the year ended 31 March, 2015 54 (2015), [http://www.cag.gov.in/sites/default/files/audit\\_report\\_files/Report\\_3\\_2016\\_Public\\_Sector\\_Undertakings\\_Maharashtra\\_0.pdf](http://www.cag.gov.in/sites/default/files/audit_report_files/Report_3_2016_Public_Sector_Undertakings_Maharashtra_0.pdf).

comprehensive policy guidelines providing a pathway for policy formation. Instead, there are separate initiatives by the central and state governments. For instance, JNNSM is an initiative of the central government, whereas RPOs and RECs come under state jurisdiction. For specific technologies, central government policies and guidelines have been implemented to different degrees by individual states, which can result in inconsistencies between states. For example, states have different policies regarding which entity (developer, power purchaser, or transmission and distribution company) is required to finance the extension of transmission and distribution lines when generation facilities are developed beyond the reach of the current grid. States also have different regulations regarding technical standards such as mandating the location of the meter, which affects the measurement of the amount of energy that is sold to the grid<sup>125</sup>.

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<sup>125</sup> *REEEP, Policy and Regulatory Review—Special Report on India and Indian States, 2009, [http://toolkits.reeep.org/file\\_upload/296\\_tmpphdxs0Zs.pdf](http://toolkits.reeep.org/file_upload/296_tmpphdxs0Zs.pdf).*

## CHAPTER 4

### COMPARATIVE STUDY

In order to analyse the present renewable energy sector one need to comparative study of the existing structure with regulatory setup in other countries leading in renewable energy. Germany is considered as the front runner in bringing the legislation on the renewable energy in the world. In the year 1991 the Grid-feed in Law came into force promoting renewable energy in Germany. Latter on other countries have brought renewable energy law. China after instituting a national cap-and-trade programme would become the largest system of such a kind in the world and is currently the world's largest producer of solar PV power. We may look into the renewable energy law prevailing in some countries and Draft Renewable Energy Act, 2015 in order to make a comparison between the renewable energy laws of those countries with the laws promoting renewable energy in India.

#### **4.1 People's Republic of China**

In 2005<sup>126</sup> China introduced its comprehensive renewable energy law which came into force in 1<sup>st</sup> January 2006 which was later amended in 2009. It has five core management mechanisms<sup>127</sup> to promote energy generation through renewable energy sources:

a) Total Amount Control-

The total amount control provision specifies the government's development targets in a certain time period, which sends the market a clear signal and promotes the exploration and utilization of renewable energy.

b) Mandatory Grid Connection –

The mandatory grid connection provision requires all power grid enterprises to buy up all the renewable energy available to them. It reduces the transaction costs for renewable energy and eliminates its market entrance barriers.

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<sup>126</sup> Available at <http://en.ccchina.gov.cn/Detail.aspx?newsId=38555&TId=99> (last accessed, January 2, 2017).

<sup>127</sup> Available at <http://www.epa.gov/ogc/china/Qiu.pdf> (last accessed January 2, 2017).

c) Categorized Electricity Pricing-

The categorized electricity pricing allows different types of renewable energy to set up its own prices based on its average social costs.

d) Cost Allocation-

The cost allocation requires each region to allocate the extra cost of generating renewable energy in a fair manner, so that the energy producers do not have to absorb the whole additional costs.

e) Special Funds-

The special funds are set up to address the problem of extra costs of renewable energy production, and they provide subsidies and other forms of financial support to some renewable energy projects whose costs cannot be fully allocated to all market players.

The law is similarly arranged with 8 chapters consisting of 33 Articles. Now we may look into some important provisions of the law:

**Total amount control**

Article 8 calls for the NDRC<sup>128</sup> to implement a national renewable energy plan, including specific renewable energy targets, which leaves it up to provincial planning agencies to develop more specific implementation plans<sup>129</sup>.

**Mandatory grid connection**

Chapter IV deals with the Promotion and Application and says that the grid enterprises shall purchase all the power generated from renewable energy by the projects (Art. 14). The Gas Pipeline Network and heat Pipeline Network shall accept the access of this by the renewable projects base on biological resources (16). The Gas Selling enterprises shall include biological liquid fuel in their fuel selling system. The government encourages the Solar Projects by providing Technical Economic Policies and Technical Standards & Constructions. The Real State Enterprises will provide necessary building designs for the application of solar devices according to the standard set by the

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<sup>128</sup> National development Reforms Commission similar to Planning Commission of India/ Niti Aayog.

<sup>129</sup> Joel B. Eisen, *China's Renewable Energy Law: A Platform for Green Leadership?*, 35 Wm. & Mary Envtl. L. & Pol'y Rev. 1 (2010), <http://scholarship.law.wm.edu/wmelpr/vol35/iss1/2>.

authorities (17). The authorities have an obligation to bring a Renewable Energy Development Plan for the rural areas.

### **Cost allocation**

Article 19 deals with the pricing of renewable energy under the authority of the State Councils.

### **Special funds**

Chapter 6 provides for the creation of Government Fund for necessary incentives needed for the renewable energy projects. Apart from this the listed renewable energy projects will get loan from Financial Institutions and tax benefits.

### **Consequences on default**

The most important chapter is Chapter 7 of this law which talks about the Legal Responsibilities of the entities under this law. The Power Grid Enterprises, Natural Gas Pipeline Network, Heat Pipeline Network and Gas Selling Enterprises are subjected to the correction or compensation in their failure to meet the mandate provided under this law. The law also provides with the administrative penalty in case of their default.

The said law provides with the mandatory renewable purchase without giving any quantum. This flaw in this law cause the uncertain progress in the development in renewable energy sector in the country. The new provisions were required to meet these difficulties.

### **Renewable Energy Law of the People's Republic of China 2009<sup>130</sup>**

The revised Law states that a "protective full-amount acquisition system" is to be launched under the law<sup>131</sup>.

The amended law on this topic made significant changes in promotion and implementation of renewable energy. The most important change is in Article 14<sup>132</sup>. It

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<sup>130</sup> Available at <http://english.mofcom.gov.cn/article/policyrelease/questions/201312/20131200432160.shtml> (last accessed 2 January, 2017).

<sup>131</sup> Available at [http://www.loc.gov/lawweb/servlet/lloc\\_news?disp3\\_l205401752\\_text](http://www.loc.gov/lawweb/servlet/lloc_news?disp3_l205401752_text) (last accessed 2 January, 2017).

<sup>132</sup> Ibid.

provides with the proportion of renewable power to be generated in respect of total power generation along with the provision of implementation of that by the authorities within a given period of time accordingly. So according to this law the renewable energy generators will have to follow some standard and quantum of power generation target in a given time limit. Then the Grid Enterprise will have to consume the whole amount of power generated from renewable sources with its jurisdiction.

In China the approach towards the renewable energy promotion is target oriented and specific. The law in this country is giving importance on the appropriate implementation of renewable energy plan within the time frame according to the target. It has become mandatory to all grid enterprises to purchase the whole quantum of power generated from renewable energy projects. Another notable factor is that the renewable energy projects are also bound to maintain a certain standard and quantum of power are to be generated within certain period of time. In this respect in India the distribution utilities are only obliged to purchase certain percentage (4 to 5 % of their whole distribution) of power generated from the renewable energy projects.

#### **4.2 Australia**

In Australia, the government has a target of achieving 20% of Renewable power in the total energy mix of electricity power by the year 2020. Here renewable energy is being promoted through the Renewable Energy Certificate (RECS)<sup>133</sup> mechanism. In simple words, the mechanism connotes an idea that some entities<sup>134</sup> are obliged by law to purchase renewable power from the renewable energy generating units through the acquisition and surrender of certain specified number of Renewable Energy Certificate in a given period of time. The certificates are created by the generating unites and surrendered to an enforcement machinery, namely Renewable Energy Regulator by the liable entities. The liable entities have to submit a renewable energy assessment report to the regulator mentioning the treatment of renewable shortfall payment along with other information required to the regulator.

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<sup>133</sup> One certificate =1MWh.

<sup>134</sup> These are mainly electricity retailers who acquire more than 100MW power from power grid.



## **Legal framework of renewable energy law in Australia**

The Renewable Energy (Electricity) Act 2000<sup>135</sup> (*hereinafter* “the Act”), provides with the procedure of getting that Certificate registered and surrender of that by the liable entities. The Act provides for the revision of renewable target and the penalty for non-compliance of the obligation on the part of the liable entities.

### **Review of Renewable Target**

The Act talks about for the Regulations to specify the renewable power to be purchased by the liable entities. This target is subjected to review according to the Act under section 162. The Act talks about two type of renewable target as like, the large-scale renewable energy target and small-scale renewable energy target. The large target is guided by the Renewable Energy (Electricity) (Large-scale Generation Shortfall Charge) Act 2010. The small-scale target is guided by the Renewable Energy (Electricity) (Small-scale Technology Shortfall Charge) Act 2010. The Renewable Energy (Electricity) Regulations 2001 deals with the large scale and small-scale renewable energy schemes.

### **The Clean Energy Regulator<sup>136</sup>**

The Clean Energy Regulator is a regulating body responsible for the administration of the compliance by both the generators and the liable entities under the Act. The regulator is empowered with the administration of the Renewable Energy Target Scheme according to the Clean Energy Regulator Act 2011.

The **Australian Renewable Energy Agency (ARENA)**<sup>137</sup> is an agency which was established by the Australian Government to make renewable energy solutions more affordable in promoting renewable energy used in Australia.

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<sup>135</sup> Available at <http://www.comlaw.gov.au/Details/C2014C00229> (last accessed 8 January, 2017).

<sup>136</sup> Available at <http://www.cleanenergyregulator.gov.au/Pages/default.aspx> (last accessed 8 January, 2017).

<sup>137</sup> Available at <http://arena.gov.au/> (last accessed 8 January, 2017).

The **Clean Energy Finance Corporation (CEFC)**<sup>138</sup> is a corporation for supporting the renewable energy project through financial support. The corporation has a responsibility to build a commercial market enhancing renewable energy.

### 4.3 United Kingdom

#### Electricity Act 1989

The Electricity Act 1989 says that the renewable obligation order may be issued by the government in promoting renewable energy in its area. The renewable obligation order means or connotes an idea of obligation of producing renewable energy certificate by the specified electricity suppliers in a given period of time to the specified Authority in respect.

Section 32(6) of the Electricity Act 1989 says that, “the renewable obligation is that the designated electricity supplier must, by each specified day, have produced to the Authority the required number of renewable obligation certificates in respect of the amount of electricity supplied by it during a specified period to customers in the relevant part of Great Britain.”

In the context, we may look into the legal provision relating to Renewable Energy Certificate (REC) in India. In consonance of the Policy the Central Electricity Regulatory Commission (Terms and Conditions for recognition and issuance of Renewable Energy Certificate for Renewable Energy Generation) Regulations, 2010<sup>139</sup> came into effect. The National Load Despatch Centre (NLDC)<sup>140</sup> established under sub-section (i) of Section 26 of the Electricity Act, 2003 is the Central Agency responsible for registration, issuance and maintenance of the Solar REC under this Regulations.

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<sup>138</sup> Available at <http://www.cleanenergyfinancecorp.com.au/what-we-do.aspx> (last accessed 8 January, 2017).

<sup>139</sup> Available at [http://cercind.gov.in/Regulations/CERC\\_Regulation\\_on\\_Renewable\\_Energy\\_Certificates\\_REC.pdf](http://cercind.gov.in/Regulations/CERC_Regulation_on_Renewable_Energy_Certificates_REC.pdf) last visited as on 29/9/2014.

<sup>140</sup> Available at [http://cercind.gov.in/Regulations/Notification\\_Renewable\\_Energy\\_Generation.pdf](http://cercind.gov.in/Regulations/Notification_Renewable_Energy_Generation.pdf) last visited as on 29/9/2014.

“Through such a mechanism, the renewable energy based generation companies can sell the electricity to local distribution licensee at the rates for conventional companies can sell the electricity to local distribution licensee at the rates for conventional power and can recover the balance cost by selling certificates to other distribution companies and obligated entities enabling the latter to meet their renewable power purchase obligations. In view of the comparatively higher cost of electricity from solar energy currently, the REC mechanism should also have a solar specific REC”<sup>141</sup>.

### **Sustainable Energy Act 2003**

Energy Efficiency in residential accommodations is the key aspect of this legislation. The Act provides that some authorities have an obligation to designate energy efficiency aim within certain period of time. The authorities (mentioned in this Act) must consider about the heating, cooling, ventilation, lighting and insulation of residential accommodation in designating an energy efficiency aim.

The Act contains the following main provisions:

- Section 1 imposes a duty on the Secretary of State to report annually on progress towards four specified energy policy goals, namely cutting the United Kingdom's carbon emissions, maintaining the reliability of the United Kingdom's energy supplies, promoting competitive energy markets in the United Kingdom, reducing the number of people living in fuel poverty in the United Kingdom
- Sections 2 and 3 provides a duty on the Secretary of State (and separately on the National Assembly for Wales) to designate and take reasonable steps to achieve at least one energy efficiency aim for residential accommodation
- Section 4: empowers the Secretary of State (and, separately, the National Assembly for Wales), following consultation with bodies representing local authorities, to direct one or more local authorities to take measures to improve the energy efficiency of residential accommodation. There is also a duty on local

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<sup>141</sup> Available at [http://powermin.nic.in/acts\\_notification/electricity\\_act2003/pdf/Amendment\\_Tariff\\_Policy\\_20Jan\\_2011.pdf](http://powermin.nic.in/acts_notification/electricity_act2003/pdf/Amendment_Tariff_Policy_20Jan_2011.pdf) (last accessed January 6, 2017).

authorities when so directed to give preference to measures that would also contribute to tackling fuel poverty;

- Section 5: imposes a duty on the Secretary of State to set targets for the use by the Government of electricity generated using Combined Heat and Power (CHP)
- Section 6: imposes a duty on the Gas and Electricity Markets Authority to undertake and publish impact assessments, including environmental assessments, before implementing significant proposals;
- Section 7: empowers the Secretary of State to direct the Gas and Electricity Markets Authority to pay up to £60 million into the Consolidated Fund from surplus funds arising from the Non Fossil Fuel Obligation (NFFO). There is also a corresponding duty on the Secretary of State to use the same amount to promote renewable energy

### **Climate Change and Sustainable Energy Act 2006**

The objects of the Climate Change and Sustainable Energy Act 2006 is reduction of emissions of greenhouse gases, elevation of fuel poverty, Promotion of micro generation, Use of heat produced from renewable sources, Building Regulations compatible with these objects and renewable obligation relating to generation, supply and transmission charges of electricity from renewable energy Features of the Act are as follows:

- **Reports on greenhouse gas emissions:** The Secretary of States have been provided with a duty to report to the Parliament regarding the level of the greenhouse gas and the steps taken by the government departments to reduce the same.
- **Local Authorities:** The local authorities like parish council (first tire of self government in UK), local energy communities etc must follow the report published by the Secretary of States relating to the energy efficiency, increase micro generation, reduce greenhouse gas emissions and elevate fuel poverty. These local authorities are required to follow this report in exercising their functions.

- **Micro generation:** The Act imposes an obligation on the Secretary of States to fix micro generation (the small-scale production of heat and/or electricity from a low carbon source.) target to meet.
- **Building Regulations relating to emissions and use of fuel and power:** The Act clearly says that the summary proceedings for breach of Building Regulations must commence within 6 months. On the other hand the Building Act 1984 deals with the conservation of fuel and power and the reduction of greenhouse gas emission. The Building Act provides that the approved inspector if discovers any breach of the Act may handover the case to the local authority who shall go for the summary proceedings.
- **Carbon emissions reduction targets:** The Act talks about the imposition of carbon emissions reduction targets. The gas transporter and supplier & electricity distributor and suppliers are required to achieve a carbon emissions target under the supervision of the Secretary of States.
- **Community energy and renewable heat:** The micro generation (generation of electricity from low energy sources like small scale wind resources, solar electricity etc.) of energy by the community energy projects may be promoted under the supervision of the Secretary of States.

#### **Draft Climate Change Bill 2007<sup>142</sup>**

The bill aims at to reduction of green house gas in the country. In this context, the promotion and application of green energy is a substantive path to this purpose. The bill talks about the limiting and encouraging activities which has direct or indirect impact on the reduction of green house gas. The bill also provides that these activities may be promoted through secondary legislation.

The relevant clauses in this respect are as follows:

Clause 28(b) empowers the Secretary of State to make provision by regulations for “trading schemes” encouraging activities that cause or contribute, directly or indirectly to the reduction of greenhouse gas emissions or the removal of greenhouse gas from the atmosphere.

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<sup>142</sup> Climate Change Act 2008 has come into force.

Clause 29 provides for the activities where trading schemes may be applied that includes the renewable sources activities that causes reduction of green house gas.

Clause 30(2) provides for the matters that may or must be provided for in regulations. These have been provided with Schedule 2 of this bill that imposes great importance on the scheme encouraging activities that cause or contribute to the reduction of greenhouse reduction from atmosphere.

The bill also mention that the renewable obligation<sup>143</sup>, renewable transport fuel obligation<sup>144</sup> and heat generating applying renewable energy are substantial impact on the reduction of greenhouse gas.

#### 4.4 Germany

##### **Renewable Energy Sources Act (EEG) of Germany**

In Germany the Grid-feed-in Law came into force in 1991. The Act provides that the private electricity supply undertakings to purchase electricity produced in their area of supply from renewable energy sources at minimum prices higher than the real economic value of that type of electricity, and, then distributes the financial burden resulting from that obligation within those electricity supply undertakings and upstream private electricity network operators.

Then in place of the Grid-feed-in Law the Renewable Energy Sources Act 2000 (EEG 2000) came to light with 12 sections promoting solar PV system through feed-in tariffs mechanism. In 2004 the EEG was amended providing legal status to the renewable power plant operators and network operators. From 2009 to 2012 the EEG Act was amended several times. The changes give the renewable energy generators an opportunity of direct marketing. The EEG 2012 provides that the producers of renewable electricity may opt to market the electricity themselves without receiving the fixed-in tariffs paid under the EEG. Along with this they may claim a market premium in addition to the revenue obtained by the sale of the electricity. The EEG Act 2014 is

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<sup>143</sup>A specified obligation has been there on the renewable energy producer to produce certain amount of electricity.

<sup>144</sup>It requires that the road transport fuel suppliers to ensure that Renewable Sources like bio fuels are being promoted in transport fueling.

also enforced on 1<sup>st</sup> August 2014. So we will discuss the EEG Act 2012 first then we will mention the new added aspect of the EEG Act 2014. The legislation is consisted with 66 provisions and 5 Annexes. The most important features of this Act are:

- **Target:** The Act provides with the target of renewable mix with the total electricity energy of the country and says that 35% of total power must come from renewable energy by the year 2020, then 50% by 2030, 65% till 2040 and 80% by the year 2050.
- **Focused areas:** The legislation focused on renewable generation, purchase, transmission and distribution of electricity from renewable power projects along with combine heat and power generation.
- **Grid connectivity:** Under this law the responsibility of grid connectivity is imposed on the grid operators as and when demand is made by the generators along with purchase of the power generated by those projects unites. In case of default the grid operators may be make compensation to the generators on demand.
- **Direct marketing:** The Act provides for the direct selling that means the generators may sell their power to any third parties directly for direct selling market premium.
- **Reporting:** Proper documentation, publication and transparency are given special importance with this legislation. All the players involve in this process are required to make necessary information available for the nationwide renewable energy promotion.
- **Clearing House and the Agency:** The legislation provides with the “Clearing House” as a single window instrument to facilitate the activities this process. The legislation also talks about an agency namely Federal Network Agency empowering with the capacity of monitoring the activities among the parties (generators, grid operators, transmitters and distributor). The agency also takes administrative measures imposing administrative fines in default of the provisions mentioned in section 62 of the Act. The fine may range 2000 to 50000 Euros depending on the cases. The said agency is also under the supervision of the Federal Ministry.

- The supervisory task is imposed on the shoulders of the Federal Ministry of Environment, Nature Conservation, and Nuclear Safety of the Federal Government.

### **Important feature of the EEG Act 2014<sup>145</sup>**

- The target has become based on individual renewable energy sources like Wind, Solar etc along with the decade target like the 2012 Act.
- The new generation units come under the system of mandatory direct marketing of their generated power. They may market their power directly or through direct marketer or directly.
- There are changes in tariff mechanism

The **Renewable Energy Heating Act<sup>146</sup>** came in to force in the year 2009. The object of this legislation is to increase the share of renewable heat to 14 percent by 2020. The legislation covers all the new building owners, private persons, firms, and the public sector, even if the building is to be rented are required to get a certain share of their heat from renewable energy systems (such as solar collectors, a heat pump, or a wood-fired boiler)<sup>147</sup>.

In case of Germany the country is already in advanced level of development in the promotion of renewable energy. In Germany the target of the renewable energy mix with the total electricity energy is 35% by the year 2020 while by this time India has a target of only 15% renewable energy mix. In India the responsibility for the arrangement of the grid connectivity is rest on the renewable power generators while in Germany the same responsibility is imposed on the Grid Operators. The grid operators are also liable to purchase the power generated by such projects. Proper documentation, publication and transparency in the field of renewable energy have been acquired much importance through the EEG Act, 2012 in Germany. Now the EEG Act, 2014 has come into force. It has been become mandatory under this Act that the renewable power

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<sup>145</sup> Available at, [http://www.goerg.de/en/news/legal\\_updates/german\\_renewable\\_energy\\_sources\\_act\\_2014.40797.html](http://www.goerg.de/en/news/legal_updates/german_renewable_energy_sources_act_2014.40797.html) last accessed January 6, 2017).

<sup>146</sup> The translated version of this Act could not be found.

<sup>147</sup> Available at, [http://www.erneuerbare-energien.de/EE/Navigation/DE/Gesetze/Das\\_EEWAermeG/das\\_eewaermeg.html](http://www.erneuerbare-energien.de/EE/Navigation/DE/Gesetze/Das_EEWAermeG/das_eewaermeg.html) last accessed January 6, 2017).



projects are required to sell the power generated by them directly to the purchase of power. In India direct marketing of renewable power is optional to the power generators. The Renewable Energy Heating Act came into force in 2009 in Germany and the legislation talks that the certain percentages of required heat for the building premises must come from renewable energy sources (such as solar collectors, a heat pump, or a wood-fired boiler). In India, the mandate relating to the share of renewable heat for the building premises is in the nascent stage. As only some prescribed premises (hospitals, hotels, large housing societies etc.) are required to generate renewable heat but in Germany all the premises (all the new building owners, private persons, firms, and the public sector, even if the building is to be rented) have been brought under the coverage of the Renewable Energy Heating Act.

#### **4.5 National Renewable Energy Bill, 2015**

The proposed purpose of this Act is to encourage the production of energy through the use of renewable energy sources in consensus with climate, environment and macroeconomic applications in order to reduce dependence on fossil fuels, ensure security of supply and reduce emissions of CO<sub>2</sub> and other greenhouse gases. This Act shall in particular contribute to ensuring fulfillment of national and international objectives on increasing the proportion of energy produced through the use of renewable energy sources.<sup>148</sup>

In October 2014, the MNRE had constituted an Expert Committee to provide a draft Renewable Energy Act. The Committee met on 7 November 2014, and decided to constitute a sub-group to “collate the suggestions and propose a draft Act”.<sup>149</sup>The sub-group has prepared a draft Renewable Energy Act for India. The proposed act is broadly classified into the different sections which are:

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<sup>148</sup> National Renewable Energy Bill, 2015, <http://mnre.gov.in/file-manager/UserFiles/draft-rea-2015.pdf>.

<sup>149</sup> Request for comments/observations/feed-back on the Draft Renewable Energy Act 2015, MNRE <http://mnre.gov.in/file-manager/UserFiles/dra2015-comments.html> (last accessed 10 January, 2017).

### Key features of the Bill

1. **Behind the Meter:** Behind-the-meter generation refers to a generation unit that delivers energy to load without using the transmission system or any distribution facilities unless the entity that owns or leases the distribution facilities has consented to such use of the distribution facilities and such consent has been demonstrated to the satisfaction of the authority responsible for granting interconnection.<sup>150</sup>
2. **Market Based instruments:** Market Based Instruments mean various financial or policy instruments introduced to promote development of renewable energy through the mechanism of the open market, and not involving direct government subsidies.<sup>151</sup>
3. Provision of National Renewable Energy Committee with representation from MNRE (Secy and JS); Agriculture Ministry, MoP, MoRD, Ministry of Heavy Industries, MoPNG, MoEF, POSOCO, RPC, CEA, CTU, RECI, IREDA.<sup>152</sup>
4. Provision of National Renewable Advisory Group with Chairperson (two eminent persons); Members: JS, MNRE; association of SNAs, IREDA, RECI, CEA POSOCO, CTU (total of 3 members); six members from stakeholders; other special invitees; functions include identify priorities for development, capacity building and utilisation of National RE Fund; long term vision for integrated energy resource planning (IERP); publish annual report and issue based reports.<sup>153</sup>
5. Constitution of Renewable Energy Corporation of India which shall: Act as a national level RE procurement entity; Support development of Renewable Energy Investment Zones across the country (Ministry shall through RECI work with State Governments to identify and develop RE investment zones to meet the goals under the National RE Development Plan)<sup>154</sup>
6. National RE Policy aimed at the optimum and integrated development of the renewable energy sector, and its applications, including electricity, heating, lighting, cooking, cooling, transport, irrigation, and combinations of the same. It lays down the framework and structure of the policy<sup>155</sup>

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<sup>150</sup> National Renewable Energy Bill, 2015, sec. 3(3).

<sup>151</sup> Ibid., at sec. 3(9).

<sup>152</sup> Supra note, 150 at sec. 8.

<sup>153</sup> Supra note, 150 at sec. 14.

<sup>154</sup> Supra note, 150 at Ch. 3 - 'Additional section for discussion'.

<sup>155</sup> Supra note, 150 at sec.15.

7. RE Resource assessment for all electric and non-electric applications such as utility scale electricity generation, distributed and decentralized electricity and energy generation (such as rooftop PV, solar pumping), heating, cooling, transportation, fuels etc.<sup>156</sup>
8. Assessments will be available in the public domain in an open-data format and should be accompanied by high-resolution GIS layers of transmission lines, substations, roads, forest areas etc. to assist in planning and easier project development.<sup>157</sup>
9. Model guidelines by MNRE on promotion , land use, infrastructure, best practices, bidding guidelines and benefit sharing. <sup>158</sup>
10. MNRE shall establish a national RE fund which is to be used for upscaling deployment by reducing risk and cost of capital and subsidy, and for infrastructural development and R&D.<sup>159</sup>
11. State funds supported initially by MNRE and CSR funds which shall account for compliance of CSR Contributions.<sup>160</sup>
12. RPO Targets: MNRE shall create a national, uniform and mandatory renewable electricity purchase obligation trajectory for all obligated entities. Such obligation shall be met through purchase of renewable electricity from RE generators located anywhere in the country and/or renewable electricity certificates.<sup>161</sup>
13. Licenses and Accreditation: Under the Electricity Act, 2003 supply of electricity requires a license. However, under the draft Bill, no license would be required to supply electricity from a renewable energy source. The Ministry will be responsible for setting up an accreditation program for renewable energy manufacturers, system integrators and others.<sup>162</sup>
14. Provision of RGO and penalty for non-compliance of RPO/RGO as per draft Act provisions also mentioned.<sup>163</sup>

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<sup>156</sup> Supra note, 150 at sec. 16(1).

<sup>157</sup> Supra note, 150 at sec. 16(2).

<sup>158</sup> Supra note, 150 at sec. 22.

<sup>159</sup> Supra note, 150 at sec. 23.

<sup>160</sup> Supra note, 150 at sec. 24,25.

<sup>161</sup> Supra note, 150 at sec. 32(2).

<sup>162</sup> Supra note, 150 at sec. 39(7).

<sup>163</sup> Supra note, 150 at sec. 39(7),(8),(9).

#### 15. RE Forecasting:<sup>164</sup>

- MNRE shall designate an entity (the Power System Corporation of India) as the Nodal Entity for the task of developing forecasts for all RE generation connected to the grid
- All new renewable electricity generators will provide all production data to the Nodal Entity

#### **Institutional Structure:**

- Centre & State Government will formulate, monitor and review implementation of National Renewable Energy Policy and National Renewable Energy Plan.<sup>165</sup>
- Carry out research and development and provide technical assistance relating to renewable energy technologies, including through the establishment of laboratories, testing centers and research institutes.<sup>166</sup>
- The Central Government shall constitute a body to be known as the National Renewable Energy Committee within {three} months from the date of commencement of this Act.<sup>167</sup>

#### **Supportive Eco – System**

- The Ministry shall, within one year from the notification of this Act, complete a detailed resource assessment study for all renewable energy resources.<sup>168</sup>
- Focus on development of supportive ecosystem for RE development and deployment such as but not limited to resource assessment plan, indigenous manufacturing of critical resources, availability of financial resources, commercial viability of the technologies,<sup>169</sup>
- The Ministry may set up protocols for certification including random checks for monitoring and verification.<sup>170</sup>

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<sup>164</sup> Supra note, 150 at sec. 42(3).

<sup>165</sup> Supra note, 150 at sec. 5(2).

<sup>166</sup> Supra note, 150 at sec. 4(2)(iii).

<sup>167</sup> Supra note, 150 at sec. 7.

<sup>168</sup> Supra note, 150 at sec. 16(1).

<sup>169</sup> Supra note, 150 at sec. 19.

<sup>170</sup> Supra note, 150 at sec. 18.

### **Economic and Financial Framework**

- The Ministry shall establish a National Renewable Energy Fund & it will be operated by the Central Government.<sup>171</sup>
- The State Governments may also establish a State Green Fund for the promotion of renewable.<sup>172</sup>

a) Capacity Building of Banks & Financial Institutions.<sup>173</sup>

### **RE Applications**

- The Central and State Governments shall promote the use of decentralised and stand-alone renewable energy applications in rural and urban areas.<sup>174</sup>
- Renewable energy fuels for transportation sector with due considerations for sustainability of such fuels and implications for food security of the country.<sup>175</sup>
- Within six months of this Act coming into force, state governments shall specify/ publish a list of villages and hamlets, where grid-extension is technically and economically infeasible in the next 5 years.<sup>176</sup>

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<sup>171</sup> Supra note, 150 at sec. 23.

<sup>172</sup> Supra note, 150 at sec. 24.

<sup>173</sup> Supra note, 150 at sec. 29.

<sup>174</sup> Supra note, 150 at sec. 30.

<sup>175</sup> Supra note, 150 at sec. 30(4).

<sup>176</sup> Supra note, 150 at sec. 32.

## CHAPTER 5

### SUGGESTION AND CONCLUSION

The Draft Renewable Energy Act, 2015 (proposed) provides many key provisions for the promotion of renewable energy resources including off-grid/decentralized mode of renewable energy production. However, from the perspective of future energy resource planning, there is a need to create a holistic framework to promote the use of renewable energy and its applications not only in electricity (covered under the E-Act) but also in heat and transport segments. There is also a need for an integrated energy resource mapping and planning with right set of institutional and structural support mechanisms for which the RE Law can be a pivotal legislation.

#### **Suggestion**

- **Performance based incentives:**

The rationale of subsidizing new initiatives by any government is that once they are self-sustainable in terms of manufacturing capacity they should be able to survive on their own without receiving any support in the form of subsidy or fiscal incentives from the government. The objective of providing subsidy in the renewable energy sector should also be to move away to the extent possible from capital and fiscal incentives and incline towards **performance based incentives**. The policies initiatives provided by Centre and States should shift towards performance and outcome which would reduce the fiscal burden on the government and would at the same time motivate the producers for optimum utilization of resources.

- **Extensive Decentralization:**

The Renewable Energy initiatives undertaken by the government should be extensively decentralized and power and responsibilities for the development of renewable energy sector should be transferred to Municipalities and Panchayats. The Constitutional Amendments in 1992-93 (73<sup>rd</sup> and 74<sup>th</sup> Amendment) laid

much emphasis on self-governance of rural and urban regions. Article 243G of our constitution emphasizes on vesting of rights with regard to economic development and social justice. By vesting the responsibility of development of energy through renewable sources upon such institutions will enable to reach the remote regions of the country and will help in reduction of energy disparity. Such a setup would also add to better implementation of rural electrification plans under JNSSM and DDUGJY (Deendayal Upadhyaya Gram Jyoti Yojana).

- **Development of Biogas Energy:**

Raw materials for the production of Biogas Energy is one of the most easily available resources and yet it is most underutilized renewable energy. Production of energy through Biofuel solves the problem of pollution, provides energy and also provide fertilizers for cultivation and inspite of such an array of benefits there are only two States with a comprehensive biofuel policy. National Policy and States policies should emphasize on technological sharing and R&D of new technology for augmenting energy form biogas. Different kinds of biodegradable materials should be included under the scope of biogas policies like the production of energy form Bagasse in Gujarat. Technology should be brought in to use the Sewage water to produce heat and electricity<sup>177</sup> rather than its disposal to rivers and other water bodies.

- **Promotion and Advertising of Rooftop Projects:**

Rooftop Solar PV projects are one of the most viable and efficient way of producing energy form Solar power. It requires no additional land for the establishment of the project and uses the un-used space above the building. The policies in force though sufficiently address the rooftop project establishment lacks in proper promotional activities and advertising of benefits of such installations. Apart from Net-metering which is the major incentive for rooftop projects, several other incentives can be provided to private entities such as tax exemption of purchase of equipments, installation and demonstration facility.

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<sup>177</sup> New use for sewage: producing heat and electricity, University of Nottingham, [http://www.nottingham.ac.uk/toolkits/play\\_10640](http://www.nottingham.ac.uk/toolkits/play_10640).

- **Competitive Bidding for Procurement of Energy:**

To ensure lowest cost procurement of renewable energy (particularly wind and solar), power should be purchased through an open competitive bidding process. This has proved successful and in line with the ultimate objective of reaching grid parity. This is particularly true of solar, which is at present costly, however it is expected to achieve grid parity in the Thirteenth Plan period in conjunction with the objectives of JNNSM. The competitive bidding process adopted for selection of projects has already resulted in significant reductions in base tariffs notified by CERC. The tariff for solar energy is expected to continue falling due to technological development and focus on indigenization and local manufacturing for future projects, thus paving way to grid parity in due course of time.

- **Financial Aid:**

There is a need to create a special sectoral exposure limit for the renewable energy sector by the banks for facilitating easy access to funds to utilities. Additionally, creation of special instruments like tax-free RE bonds on the line of infrastructure bonds, letter of credit would facilitate low cost and long term lendings to the renewable sector. Priority-sector status may also be granted to the renewable sector in view of the social and environmental benefits of the projects. This will act as a major policy push for the off-grid applications, which face maximum barriers in receiving low cost finances. Soft loans could be provided for setting up renewable energy enterprises.

- Vigorous promotion of renewable energy by government agencies, corporate, public sector, academic institutions etc. is needed for spreading awareness among population about the benefit of renewable energy and incentives attached to it. The government can also promulgate for establishment of national-level body to increase awareness of renewable energy at grass-root level.

- **Long term Stability and Predictability:**

Predictability and long term stability of laws and policies are the key to attract investment in the sector as it gives investors a surety that incentives and benefits availed by them are not subject to frequent change in the near future making their investment risk free.



- **Ambitious goals and targets:**

Policy implemented must always have a target and goal to achieve in the near future so as to keep the government institutions in toes for the fulfillment of such target. Setting a target acts as an motivational force to work for the fulfillment of such goal. A policy must have a short-term and medium-term target prepared beforehand for the implementation of the policy in its true spirit.

- Financial support and sponsorship for research and development in renewable energy technologies in order to enhance the technology and make use of renewables a viable source of energy production.
- Other ways for developing renewable energy sector is by way of compulsory installation of solar water heating systems for all urban residential and commercial establishments, by making it mandatory for all government buildings to install RE applications and by mandatory renewable energy systems provision for new residential, commercial and industrial buildings.

## **Conclusion**

India being a tropical country has great potential of augmenting energy from Renewable Energy Sources. Law and Policy play a vital role in attracting investment in this non-viable investment venture by incentivizing the sector. Under the Indian Constitution there is no such bifurcation of power between the Centre and the State for renewable energy and the take this power of regulating the renewable sector from Entry-38 in the concurrent list which empowers them to make laws for regulation of electricity sector. Laws at both Central and State level are crucial for the development of renewable sources in any region. The Central laws have established several regulatory institutions and organisation to facilitate accelerated growth and development in the renewable energy sector. The State laws provide for specific incentive and benefit available to investors in that particular state which depends upon various factors (e.g. terrain of the region, land use, availability of funds, etc.). In the absence of any national or state level law regulating the sector; the renewable energy sector is solely governed by national and state policies for the development of sector.

With the additional responsibility to achieve the target of 175 GW of energy from renewable sources, taken up by the country by signing the Paris Agreement; India need

to utilize resources available at its disposal at optimum levels. India's strategic focus would need to be augmenting of decentralised renewable energy capacity in the rural areas where it is having large social impact. Off-grid renewable energy applications have significant potential of reducing oil/ diesel/kerosene consumption in the country and can significantly contribute to oil import substitution. A cluster based approach for village electrification needs to be adopted. Under this approach, tariff-based bidding mechanism for such clusters inviting participation from business models would bring down the tariff by a significant amount. The difference that the consumers in the clusters are willing to pay and tariff discovered through the bidding mechanism can be financed through annual viability gap funding. The choice of technology can be left to the entrepreneurs, which would encourage entrepreneurs to constantly innovate their products and services to bring down the cost of producing electricity. Such projects would also be encouraged in the areas with grid availability but with lack of reliable supply so that power can be fed into the grid when the grid is energised and can be supplied to households when the grid is down. However, proper regulatory framework needs to be developed which can be adopted at state level, and has clear cut guidelines on monitoring, evaluation, multi-year operation and maintenance and ensures grid compatibility for such projects. Moreover, a sufficient financing mechanism for meeting out the viability gap requirement and an institutional mechanism to create an ecosystem for deployment of such projects need to be put into place.

Therefore, despite the vague promises and old hat statements of intent that it contains, the proposed National Renewable Energy Act, should come as a measure of relief to the renewable energy industry inasmuch as it also yields to several of the industry's longstanding demands. For instance, it gives legislative backing to the call that a part of the National Clean Energy Fund be earmarked for the renewable energy sector. It is emphatic on enforcement of the "renewable purchase obligation", leaving no scope for the State electricity regulators to be lenient with violators. It introduces a "take or pay" system by giving renewable power generators the "deemed generation" benefit. This means the producer is paid even if the electricity is not taken due to grid issues. It provides for compensation for distribution utilities for any premium paid for green power. While these measures provide a welcome boost to the sector, it is disappointing that other crucial issues — such as land acquisition at reasonable prices, involving local communities in project development, and incentives for distributed generation that

could bring power to un- or under-electrified areas — have been left to “guidelines” to be formalised in future.

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**Annexure 1 - Combined Summary of Renewable Energy State Policy (Common)**

<b>NAME OF POLICY</b>	<b>OPERATIVE PERIOD</b>	<b>TARGET</b>	<b>FACILITATING AGENCY</b>	<b>REGULATIONS/POLICY/ACT/EXECUTIVE ORDER</b>	<b>FUNDS</b>	<b>INCENTIVES</b>
Bihar Policy for promotion of New and Renewable Energy Sources 2011	five years from 24/06/2011	NA	Bihar Renewable Energy Development Agency (BREDA)	Policy	NA	<ol style="list-style-type: none"> <li>1. Notified National/State Policy Incentives</li> <li>2. <b>Industrial Incentive Policy</b>, and such other policies</li> <li>3. Exemption from <b>electricity duty</b>.</li> <li>4. Exempted from <b>Entry tax</b> on devices, equipment and machinery.</li> <li>5. <b>Loans</b> as prescribed ( GoI, Govt. of Bihar, IREDA &amp; MNRE).</li> <li>6. For mini/micro/small hydel schemes – <b>free usage of canal water</b> subsequent to the approval &amp; agreement with Water resources Department &amp; .</li> <li>7. The provision of section – 14 of Electricity Act 2003 for generation and distribution of electricity in rural areas will be applicable of all New and Renewable Energy projects.</li> </ol>

<p>Policy for Promoting Generation of Electricity through Renewable Energy Sources (Harayana)</p>	<p>From 23rd November, 2005 till a new policy is notified.</p>	<p>minimum of 10%(i.e. 500 MW ) of the total capacity addition of 5000 MW of conventional power</p>	<p>Haryana Renewable Energy Development Agency (HAREDA)</p>	<p>Policy</p>	<p>NA</p>	<ol style="list-style-type: none"> <li>1. Power generation and its sale exempted from the <b>electricity duty</b>.</li> <li>2. Free <b>Energy Banking facility</b> for a period of one year by the Licensee/ Utilities (subject to conditions that it will lapse and no payment will be made against if not utilised within prescribed time.)</li> <li>3. <b>Local area development tax</b> will be exempted on plant, machinery, equipment.</li> <li>4. The State Govt. will <b>acquire land if necessary</b> at the cost of Independent Power Producers (IPP).</li> <li>5. <b>Water availability</b> without royalty charge (for non-consumptive use) for power generation through micro/ mini/ small hydel plants.</li> <li>6. <b>Industrial Grant</b> (projects will be treated as “Industry” and all the incentives available to new projects will be applicable as per Industrial Policy, 2005.)</li> </ol>
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Karnataka Renewable Energy Policy 2009-14	2009-14	target for 2009 is 856 MW and the state aims to have a capacity of 6600 MW by 2014	Karnataka Renewable Energy Development Ltd (KREDL)	Policy	(i) investment of about Rs 22,000/- crores at current prices (ii) Akshaya Shakthi Nidhi (Green Energy Fund)	<ol style="list-style-type: none"> <li>1. Notified National/State Policy Incentives.</li> <li>2. <b>Energy Banking</b> charges as determined by KERC (Energy banked beyond the time prescribed will be utilized and paid for by the distribution licensee at tariff applicable.)</li> <li>3. Demand Cut exemption: Exemption of demand cut to the extent of 50% of the installed capacity assigned for captive use purpose, will be allowed.</li> <li>4. Entities will be treated as Industry and <b>Industrial Grants</b> under the provisions of the Industrial policy 2009 will be extended to all Projects.</li> <li>5. <b>Grid Tie Policy and Net metering:</b> Net metering facility will be extended to Solar power systems installed on commercial establishments and individual homes connected to the electrical grid.</li> <li>6. The state Government reserves the <b>first right of refusal</b> in respect of purchase of power produced by the Renewable Energy Sources.</li> <li>7. <b>Wheeling and Transmission Charges @ 5 %</b> will be applicable subject to the KERC norms.</li> </ol>
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					<p>8. <b>Land Allotment</b> :(i) Government Land reserved, as per the industrial planning for industrial use, will be used to set up the Renewable Energy power projects. (ii) KREDL will make arrangements to purchase land from private land owners directly.</p> <p>9. <b>Feed in Tariff</b> as determined by the KERC &amp; when plant completes 11 years it have to sell power to Energy Supply Companies on Tariff based on variable cost subject to KERC norms.</p> <p>10. KERC has determined a <b>Solar Tariff</b> of Rs. 3.40 per unit in addition to tariff allowed by MNRE (upto Rs. 12 per KWh for Solar PV and upto Rs. 10 per KWh for Solar Thermal projects).</p> <p>11. The sale to be governed by <b>Power Purchase Agreement (PPA)</b> (in a time bound manner) executed between the Power Producer and witnessed by KERC.</p> <p>12. <b>Settlements:</b> All transactions between the Distribution Licensee and the producer involving wheeling or sale of power will be settled on <b>monthly basis</b>.</p>
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						<p>13. <b>Biomass power Plants</b> are facilitated with <b>enabling Tariff</b>.</p> <p>14. ESCOMs to extend the facility of <b>Letter of Credit</b> to the Developer for realizing payment for the Renewable Energy power sold to the ESCOM (The cost for opening the Letter of Credit shall be reimbursed to the ESCOMS from Akshaya Shakthi Nidhi Funds by KREDL)</p> <p>15. The various agreements executed by the project developers with different departments of Government will be considered for <b>revision of registration fee</b> towards registering the respective agreements under the relevant provisions of Karnataka Stamps &amp; Registration Act by suitable Amendment.</p>
Kerela Renewable	From 2002	NA	Agency for Non-	Policy	NA	<p>1) KSEB will undertake to <b>augment the sub-station capacity &amp; transmission lines</b> at its cost to receive the power generated by the eligible producer and would lay new lines if required.</p>

Energy Policy, 2002			conventional Energy and Rural Technology (ANERT)		<p>2) <b>Tariff:</b> Power generated if purchased by KSEB, will be at a ceiling rate of Rs.2.50 per unit for power from small hydel power plants &amp; Rs. 2.80 for power from all other renewable energy sources with 5% escalation for every year upto 5 years of operation and thereafter the rate shall be mutually settled between KSEB and the eligible producer.</p> <p>3) <b>Energy Banking:</b> KSEB can bank 100% of the power generated from June to February for every financial year but from March to June it will be subject to availability.</p> <p>The producer can take this banked power back only during the period from June to February of the same financial year. If the banked energy is not utilised at the end of the year, it will be lapsed and if this is sold to KSEB, the same will be purchased by KSEB at the average selling rate of KSEB applicable during the corresponding year.</p> <p>4) Uniform <b>Wheeling</b> charges (5% of energy fed into the grid) to transmit and make it available to producer for captive use or for banking it.</p>
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					<p>5) KSEB shall <b>initially bear the expenditure for erection of high-tension sub-stations</b> and transmission infrastructure and ANERT shall recover 50% of this expenditure from the power project promoters and will give it to KSEB.</p> <p>6) All transactions between KSEB and eligible producer involving wheeling, banking or sale of power will be <b>settled on a monthly basis</b>.</p> <p>7) KSEB and eligible producers under this policy, intending to sell power to KSEB/ to wheel/ to bank will enter into a <b>Power Purchase Agreement (PPA)</b> for a minimum period of five years.</p> <p>8) KSEB is to provide <b>Letter of Credit</b> by any Nationalised Bank.</p> <p>9) All new projects producing power is to be given <b>industrial status</b> and are eligible industry under the schemes administrated by Industries Department.</p> <p>10) Renewable Energy equipment and materials shall be <b>exempted from Entry Tax/ Octroi</b>.</p>
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<p>Comprehensive Policy for Grid-connected Power Projects based on New and Renewable (Nonconventional) Energy Sources – 2015</p>	<p>2015-20</p>	<p>total of 14,400 MW capacity to be installed in the next 5 years 5000M W- Wind, 1000M W- Bagasse-co-generation, 400MW- Small Hydro,</p>	<p>Maharashtra energy development agency (MEDA)</p>	<p>Policy</p>	<p>Green Cess Fund</p>	<p>1. <b>Electricity Duty</b> will not be levied for the <b>first 10 years</b> in respect of bagasse/ agriculture waste based co-generation power projects, Small Hydro, Solar, Industrial Waste based projects &amp; Biomass projects. 2. The Small Hydro, Industrial Waste based projects and Biomass project developer as per availability of funds will be given <b>financial assistance</b> from green cess fund upto a maximum of <b>1 crore</b> per project for <b>evacuation arrangement</b> made. 3. Exemption from obtaining <b>NOC/ consent form Pollution Control Board</b> for Wind and Solar projects. 4. <b>Industrial Treatment</b> of Wind and Solar establishments. <b>Wind:</b> 1. <b>Re- powering</b> of existing wind electric generators. 2. <b>Deemed non-agricultural land status</b> for the land procured for project. <b>Bagasse/Agriculture Waste based Co-generation:</b> Exemption from tax on sugarcane purchase, as</p>
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		300MW-Biomass, 200MW-Industrial Waste, 7500MW-Solar.				mentioned in Govt. Resolution no. Bagasse-20133/C.R.165/Energy-7. <b>Small Hydro Power:</b> A Capital Subsidy of Rs.50,000 per kW of generation capacity, subject to a maximum of 1 crore per project from green cess fund. <b>Biomass:</b> A Capital Subsidy of Rs.1 Crore per project will be given, subject to availability. <b>Solar:</b> 1. Sale of electricity generate can be by way of <b>competitive bidding</b> . 2. <b>Deemed non-agricultural land status</b> to land procured for projects. 3. Government land, equipment and machinery for the manufacture of solar modules as per availability may be allotted <b>on lease at 50% concessional rate</b> .
Policy For Harnessing Renewable	From 2008	By 2020-600 MW-Micro/Mini/Small	None. Rather Empowered Committee of	Policy	NA	1. UPCL will have the <b>first right of purchase</b> on the electricity generated as per price determined by the UERC 2. UPCL/PTCUL will undertake to transmit through its grid the power generated and make it available to the producer at <b>predetermined wheeling charges</b> .

Energy Sources in Utrakhand with Private Sector/Community Participation.		Hydro projects, 220 MW through Co-generation, 300MW through Biogas.	Administrative Secretaries is constituted for single window clearance.			<p>3. UPCL would extend the facility of <b>Energy Banking</b> to the developers at mutually agreed terms.</p> <p>4. For <b>Evacuating arrangement</b> requisite network of transmission/ distribution lines would be provided by UPCL/PTCUL.</p>
State Policy on Renewable Sources,2006	until superseded or modify by another policy	NA	Manipur Renewable Energy Development Agency (MANIRED)	Policy	NA	<p>1. <b>Exemption from Electricity Duty</b> for a period of 5 years from the Commercial Operation Date (COD).</p> <p>2. Producers will be treated as <b>eligible industry</b> under the schemes administered by Industry Department and incentives available to industrial units under such schemes shall be available.</p> <p>3. <b>Sales Tax Exemption</b> under the provision of schemes notified in this respect by Finance Department as modified from time to time.</p>

					<p>4. <b>Wheeling:</b> - Power Department will undertake to transmit on its grid the power generated by eligible producer and make it available to him for captive use or to a third party nominated by eligible producer for sale within the State, at a uniform, <b>wheeling charge of 2%</b> of the energy fed to the grid, irrespective of the distance from the generating station.</p> <p>5. <b>Purchase of Power at attractive rate</b> of Rs. 2.25/- unit, with no restriction on time or quantum of electricity supplied for sale. This rate will be increased at the rate of on first April of the year for a period of ten operational year.</p> <p>6. <b>Settlement on monthly basis</b> of all transactions between the Power Department, and the eligible producer involving wheeling, banking or sale.</p> <p>7. Development of Small Hydro Power Projects (SHP's)</p> <p>8. The Power Department will all <b>Energy Banking</b> by eligible producers for a period upon one year.</p>
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Policy for promoting generation of Power through Non-conventional Energy sources	NA	NA	Meghalaya Non-Conventional and Rural Energy Development Agency (MNREDA)	Policy	NA	<ol style="list-style-type: none"> <li>1. <b>Exemption from Electricity Duty</b> for a period of 5 years.</li> <li>2. The producer will be allowed to use the water for power generation. <b>Royalty on the water</b> used for small Hydro Projects will be charged as admissible.</li> <li>3. Eligible Producer will be eligible for <b>Sales Tax/ VAT deferment/ remission</b> under the provision of schemes notified in this respect by Finance Department as modified from time to time.</li> <li>4. <b>Infrastructural facilities</b> such as approach roads, water supply, crane, power during construction period etc will be provided on the lines of industrial estates.</li> <li>5. <b>Wheeling:</b> The State Transmission utility will undertake to transmit on its grid the power generated by eligible producers and make it available to him for captive use or to a third party nominated by eligible producers for sale within the state, at an applicable wheeling charge.</li> <li>6. <b>Purchase of power at attractive price</b> as fixed by the SERC on mutually agreed terms.</li> </ol>
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<p>Power Policy For Power through Non-Convention al Energy Sources (Mizoram)</p>	<p>from date of publicatio n in the official gazette (15.10.200 3) until superseded or modified by another order</p>	<p>NA</p>	<p>Zoram Energy Development Agency (ZEDA)</p>	<p>Policy</p>	<p>NA</p>	<ol style="list-style-type: none"> <li>1. <b>Exemption from electricity duty</b> for electricity generated for captive use or sale to third party.</li> <li>2. Producers to be <b>treated as industry</b> under the schemes administered by Industry Department and will receive all incentives available.</li> <li>3. Concession given to the industrial unit in the <b>backward areas</b> to be provided to Developers.</li> <li>4. <b>Infrastructural facilities</b> such as approach road, water supply, power during construction period, etc.</li> <li>5. State Government to extend <b>all incentives and facilities granted by the Central Government</b> for similar Undertakings.</li> <li>6. Renewable Energy <b>equipment and materials shall be exempted</b> from State sales tax</li> <li>7. Infrastructural facilities such as approach road, water supply, power <b>during construction period</b>, etc.</li> </ol>
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<p>New and Renewable Sources of Energy (NRSE) Policy ,2012 (Punjab)</p>	<p>from the date of its notification (26.12.2012) in the official gazette of Punjab Government and shall remain in operation till the Government notifies the new policy</p>	<p>NA</p>	<p>Punjab Energy Development Agency (PEDA)</p>	<p>Policy</p>	<p>NA</p>	<p><b>1. Free Energy Banking</b> for a period of one year by PSPL/Licensee/PSTCL. However, the energy banked during non-paddy season and non-peak hours will not be allowed to be drawn during paddy season and peak hours respectively.</p> <p><b>2. Electricity Duty Exemption</b> for power consumed from state licensee during construction and testing of the project.</p> <p><b>3.</b> All projects developed under this policy will be <b>treated as industry</b> in terms of industrial policy of the state and all the incentives available.</p> <p><b>4.</b> PSPCL/LICENSEE/PSTCL will provide facility of <b>irrevocable and revolving, Letter of Credit</b> issued by any nationalized bank, amount equivalent to the bill amount of one month on the basis of average of last three months.</p> <p><b>5. Exemption from payment of fee and stamp duty</b> for registration/lease deed charges for the land required for the project.</p> <p><b>6. Manufacturing &amp; sale</b> of Renewable energy devices/systems, and equipments / machinery</p>
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						<p>required for Power Projects shall be exempted from <b>Value Added Tax (VAT)</b> and any <b>cess</b> thereupon.</p> <p>7. PSPCL/LICENSEE/PSTCL will <b>accept the injection of energy in full even during sustained high frequency hours</b> to ensure full utilization of non-conventional energy resources and merit order shall not be applicable.</p> <p>8. PSPCL/Licensee will <b>clear dues within 60 days</b>. However if the Developer requests for payment in 30 days or against Letter of Credit / payment in 7 days, rebate of 1% or 2% respectively, as the case may be, will be admissible and delay in payments will attract interest as per PSERC/CERC regulations.</p>
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Policy on Co-generation and Generation of Electricity	from 2012 ;till 13th five year plan (2022)	NA	West Bengal Green Energy Development Corporation Ltd.	Policy	Green Energy Fund shall be created by Nodal Agency (allocation from budget)	<p>1. <b>Exemption of demand cut</b> to the extent of 50% of the installed capacity assigned for captive use purpose will be allowed subject to the Regulations of the Commission.</p> <p>2. The host and obligated distribution utilities shall provide revolving <b>Letter of Credit</b> from a nationalized bank as a payment security mechanism for all RE projects.</p> <p>3. In case of RE project construction in very remote areas, some <b>infrastructural support</b> including approach roads to the project site may be provided at Government cost.</p>
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**Annexure 2 - Combined Summary of Solar State Policy**

<b>NAME OF POLICY</b>	<b>OPERATIVE PERIOD</b>	<b>TARGET</b>	<b>FACILITATING AGENCY</b>	<b>REGULATION/POLICY/ACT/EXECUTIVE ORDER</b>	<b>FUNDS</b>	<b>INCENTIVES</b>
Andhra Pradesh Solar Power Policy, 2015	5years (from 12.02.2015 ) and/ or shall remain in force till such time a new policy is issued.	addition of 5,000 MW in the next five years	New and Renewable Energy Development Corporation of A.P. Ltd (NREDC AP)	Policy	NA	<p>1. <b>Transmission and Distribution charges</b> are exempted for wheeling of power generated from Solar Power Projects.</p> <p>2. <b>Distribution losses</b> are exempted only for Solar Power Projects injecting at 33 kV or below irrespective of voltage-level of the delivery point</p> <p>3. <b>Energy Banking</b> of 100% of energy shall be permitted during all 12 months of the year subject to charges in kind @ 2% of the energy delivered at the point of drawal.</p> <p>Drawals from banked energy shall not be permitted during five (5) month period from 1st April to 30th June and 1st February to 31st March.</p> <p>Drawls of banked energy during the <b>Time of the Day (ToD)</b> applicable during the <b>peak hours</b> shall also not be permitted throughout the year.</p> <p>The unutilized banked energy shall be considered as deemed purchase by Discoms at prices determined by the APERC.</p>

					<p>4. <b>Intra-state Open Access</b> for the whole tenure of the project or 25 years (whichever is earlier) will be.</p> <p>5. Electricity produced shall be exempted from <b>Electricity duty</b> if used for captive consumption, sale to Discom(s) and third party sale.</p> <p>6. <b>Cross subsidy surcharge</b> shall be exempted for third party sale for a period of five (5) years, provided it is produced within the State.</p> <p>7. Reduction in <b>Contract Demand</b> is available to Scheduled Consumers for a period of five (5) years from the date of commissioning of the project.</p> <p>9. Establishment to have <b>deemed industry status</b> and incentives under the schemes administered by the Industries Department shall be available producers.</p> <p>10. Projects shall be eligible for <b>Deemed Public Private Partnership (PPP)</b> status.</p> <p>11. <b>Deemed Non-Agricultural (NA) status</b> for the land where Solar Power Projects will be accorded, on payment of applicable statutory fees.</p> <p>14. Developers <b>exempted from obtaining any NOC/Consent</b> for establishment under pollution control.</p>
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Chhattisgarh Solar Energy Policy 2012	from 2012 to 31st March 2017	500 to 1000 MW by March 2017.	Chhattisgarh State Renewable Energy Development Agency (CREDA)	Policy	NA	<ol style="list-style-type: none"> <li>1. Interest subsidy</li> <li>2. Fixed capital investment subsidy</li> <li>3. Exemption from electricity duty</li> <li>4. Exemption from stamp duty</li> <li>5. Exemption/concession in land premium</li> <li>6. Project report subsidy</li> <li>7. Technical patent subsidy</li> <li>8. VAT exemption by the commercial tax department.</li> <li>10. Cross Subsidy surcharges will not be applicable for open access obtained for third party sale within the state.</li> <li>11. <b>Energy banking</b> facility will be allowed at mutually agreed terms.</li> <li>12. Government land will be made available to the project developer as per the prevailing state policy else, it is the responsibility of the developer.</li> </ol>
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Gujarat Solar Power Policy-2015	up to March 31, 2020.	NA	Gujarat Power Corporation Limited (GPL)	Policy	NA	<p>1. Incentives under <b>Gujarat Industrial Policy 2015</b> will be available to developers.</p> <p>2. For setting up semiconductor wafer facilities, solar cell manufacturing, solar modules and panel manufacturing, solar lanterns/ lamps manufacturing and all the systems and devices that come under the purview of solar technology incentives under <b>Electronics Policy for the State of Gujarat (2014-19)</b> will be available.</p> <p>3. The manufacturer/ Developers may avail the benefits of <b>Modified Special Incentive Package Scheme (M-SIPS) of Government of India.</b></p>
H.P. Solar Power Policy-2016	valid until 31.03.2022, unless modified or extended.	700 MW capacities to be created by 2022	Himachal Pradesh Energy Development Agency HIMURJ	Policy	NA	NA

Haryana Solar Power Policy, 2016	from 14.03.2016 till a new Policy is notified	3200 MW solar power by the year 2021-22	Haryana Renewable Energy Development Agency (HAREDA)	Policy	NA	<p><b>1. Power Evacuation Facility:</b> The State utility or T &amp; D Licensee shall bear the cost of Extra High Voltage (EHV)/ High Voltage (HV) transmission line up to a distance of 10 km.</p> <p>2. All electricity taxes &amp; cess, electricity duty, wheeling charges, cross subsidy charges, Transmission &amp; distribution charges and surcharges will be totally waived off for Ground mounted and Roof Top Solar Power Projects.</p> <p>3. <b>Status of Industry</b> to all new projects of MW scale generating solar energy and entitlement to all the incentives available to industrial units under the industrial policy.</p> <p>4. <b>Price Preference</b> will be given to IPPs who set up the Solar Power Plants in the State.</p> <p>5. <b>Banking</b> of energy shall be allowed for a period of one year and in case of non-utilization within a period of twelve months from the date of power banked, it will automatically lapse and no charges shall be paid in lieu of such power.</p> <p>6. A generating company engaged in generation of electricity from Solar Power Plant shall be eligible to avail the <b>Renewable Energy Certificates</b> as per regulations of the CERC.</p>
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					<p><b>7. Exemption:</b></p> <p>(i) these projects not require any change of Land Use approval from Town &amp; Country Planning Department.</p> <p>(ii) The project shall also be exempted from External Development Charges (EDC), scrutiny fee and other charges.</p> <p><b>8. Exemption of Environment Clearance</b> from the Haryana Pollution Control Board.</p> <p><b>9. Exemption in Stamp Duty for lease of land for projects</b> for MW scale for setting up of these projects.</p> <p>10. The developers setting up the ground mounted MW scale solar power plants may <b>use of unutilized space</b> between the installed solar panels for commercial floriculture/horticulture related activities provided that it does not affect solar power generation.</p> <p><b>11. Tenure of Power Purchase Agreement</b> between IPP and HPPC shall be valid for a period of 25 years.</p>
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Solar Power Policy for Jammu & Kashmir 2013	NA	NA	(i)Jammu and kashmir Energy Development Agency (ii)Ladakh Renewable Energy Development Agency (iii) Kargil Renewable Energy Development Agency	Policy	NA	<ol style="list-style-type: none"> <li>1. <b>Entry tax:</b> No entry Tax will be levied by the State Government on pwer generation/transmission equipment and building material used for Solar Power Plants.</li> <li>2. <b>Land:</b> Government land, if required, for Power Projects shall be acquired by JAKEDA strictly as per project requirement for the developer and leased to the developer on payment of premium/rentals to be determined by the Government till the expiry of concession period.</li> <li>3. For <b>Forest Land</b> the state will facilitate permission for use of forest land for non-forest purpose under J&amp;K Forest Conservation Act with appropriate charges payable.</li> <li>4. <b>Exemption from Stamp Duty</b> for Mortgage Deed signed between the financing institutions and promoters.</li> <li>5. <b>Exemption from Court Fees</b> for registration of documents relating to the lease of land.</li> <li>6. <b>No Royalty</b> to be paid for the Solar Power Projects until any provision is incorporated by the MNRE.</li> <li>7. <b>Electricity Duty</b> payable @ 4 paisa per unit under J&amp;K Electricity Duty Act,1963.</li> <li>8. <b>Banking of Energy</b> for a period of 2 months.</li> </ol>
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						9. <b>Demand Cut exemption</b> to the extent of 50% of the installed capacity shall be allowed.
Jharkhand State Solar Power Policy 2015	10.08.2015	increase solar generation to 2650 MW of solar energy by 2020	Jharkhand Renewable Energy Development Agency (JREDA)	Policy	NA	<p>1. <b>Exemption from the payment of Electricity Duty</b> for 10 years for Solar Power Projects within the state.</p> <p>2. <b>Deemed Industry Status</b> to all projects and incentives available to industrial units shall be available to all developers.</p> <p>3. <b>Exemption Pollution Clearance</b> and obtaining any NOC/consent for establishment, consent to operate from JSPB.</p> <p>4. <b>Open Access</b> will be allowed for the whole tenure of the project or 25 years , whichever is early.</p> <p>5. <b>Exemption from payment of Conversion Charges</b> for residential consumers opting for implementation of rooftop solar PV power plant (Commercial Tax).</p> <p>6. <b>Exemption from the payment of VAT</b> for the equipment purchased for installation of solar plants.</p> <p>7. <b>Exemption from wheeling Charges</b> of 4% of wheeling charge in terms of energy injected and balance wheeling charges shall be borne by the project developer.</p>



					<p>8. <b>Exemption from Distribution Losses</b> for Projects injecting at 33KV or below irrespective of the voltage level of the delivery point.</p> <p>9. <b>Exemption from payment of Cross Subsidy Surcharge</b> for third party sale, provided the source of power is from Solar Project setup within the state.</p> <p>10. <b>Banking of Energy</b> for 100% of energy during all 12 months of the year with charges adjusted in kind @2% of the energy delivered at the point of drawal The drawal shall not be permitted during five months from 1st april to 30th june and 1st february to 31st march and Time of the Day(ToD) and the unutilised banked energy shall be considered as <b>deemed purchase</b> by Discom.</p> <p>11. <b>Height of Module Structure</b> shall not be counted towards total height of the building under the building bye laws.</p> <p>12. <b>Third Party Sale</b> within or outside the State will be allowed as per Electricity Act 2003 and Orders and/or Regulations issued by JSERC.</p> <p>13. <b>Must run status for Solar Power Projects:</b> Injection from Solar Power Projects shall be considered to be deemed scheduled.</p>
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					<p>14. <b>Deemed Public Private Partnership (PPP) Status</b> shall be provided for projects for development of solar power plants for sale of Electricity to the Distribution Licensees.</p> <p>15. Scheduled Consumers can <b>avail reduction in Contract Demand</b> for a period of five years from the date of commissioning of the project.</p> <p>16. <b>Clean Development Mechanism Benefit</b> to the solar power project developers/investors shall be as per the provisions of JSERC.</p> <p>17. Solar Industry shall be declared as a <b>priority industry</b>.</p> <p>18. <b>Exemption from electricity duty and banking charge</b> for 25 years or project life, if the project is completed and commissioned within the scheduled period</p> <p>19. <b>Land:</b> (i) state government shall identify and provide land for developing solar power projects <b>on competitive tariff bidding basis</b>.</p> <p>(ii) Government Land in the '<b>Industrial Zone/area</b>' shall be provided on priority for setting up of the solar power plants, solar manufacturing industries, Solar parks.</p>
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						<p>(iii) Land may be provided on priority and on long term lease basis for solar power plants of capacity 500 MW or more at JSERC power tariff.</p> <p>(iv) Government shall introduce a <b>land bank scheme</b> to facilitate quick availability of land</p> <p>(v) 100% waiver on <b>land use conversion charges/fees</b></p> <p>(vi) 100 % exemption from payment of <b>fee and stamp duty</b> for registration of lease deed for allotment of government land and on purchase of private land.</p>
Karnataka Solar Policy 2014-21	from 2014 until 2021 or till such time any change is made by the state government.	add minimum 2000 MW by 2021	Karnataka Renewable Energy Development Limited(K REDL)	Policy	NA	<p>1. <b>Tax concessions</b> in respect of entry tax, stamp duty and registration charges according to Karnataka Industrial Policy.</p> <p>2. GoK gives full powers to Deputy Commissioner to approve purchase of agriculture lands u/s 109 of Land Reforms Act for development Act for development of solar projects.</p> <p>3. Developer will be allowed to start project execution without waiting for formal approval on filing application for conversion of agricultural land for setting up of solar power projects on payment of specified fees.</p>

Kerala Solar Policy 2013	from 25.11.2013 until superseded or modified by another policy	to 500MW by 2017 and 2500 MW by 2030	Agency for Non-Conventional Energy and Rural Technology (ANERT)	Policy	NA	<ol style="list-style-type: none"> <li>1. <b>Evacuation Facility</b> for the projects with capacity less than or equal to 10MW beyond the pooling station shall be provided by KSEB.</li> <li>2. <b>Full Exemption of Electricity Duty</b> for the energy generated under this policy.</li> <li>3. <b>No Open Access charges</b> for solar projects for wheeling the power within the state.</li> <li>4. <b>Wheeling charges and T&amp;D losses</b> will not be applicable for the Captive Solar generators within the state.</li> </ol>
Policy for the Implementation of Solar Based Projects in Madhya Pradesh, 2012	NA	NA	Madhya Pradesh Urja Vikash Nigam Limited	Policy	NA	<ol style="list-style-type: none"> <li>1. <b>Banking of Energy</b> of 100% of energy in every financial year shall be permitted subject to certain conditions.</li> <li>2. <b>Electricity Duty and cess exemption</b> for all Solar projects for a period of 10 years from the date of commissioning of the project.</li> <li>3. <b>Industry status</b> to all projects and eligibility for all benefits under Industrial Promotion Policy but the provisions under the new Solar Policy shall prevail.</li> <li>4. <b>VAT exemption / entry tax</b> for the equipments purchased for plants under the policy.</li> </ol>

Uttar Pradesh Rooftop Solar Photovoltaic Power Plant Policy, 2014	remain valid until superseded or modified till March 2017 whichever is earlier	20 MW Through equal contribution by Private and Public institutions by 2016-17	Uttar Pradesh New and Renewable Energy Development Agency	Policy	Funds will be provided by State Government	NA
Solar Power Policy Uttar Pradesh 2013	up to 31 March 2017	500 MW of Grid connection	Uttar Pradesh New and Renewable Energy	Policy	By State Government under budget	1. Special incentive by the state government on case to case basis for <b>solar farms</b> where many solar power plants are installed and the total investment is more than Rs.500crores. 2. All the <b>incentives</b> provided under the Uttar Pradesh State <b>Industrial Policy, 2012</b> will be applicable on solar plants.

		ected solar power plant by march 2017	Developm ent Agency (UPNEDA )		y head “Incentiv e scheme for Solar Power Generati on”	3. Expenditure on the construction of transmission line and substation will be borne by the State Government on all the projects in the <b>Bundelkhand region</b> .
Telangana Solar Power Policy 2015	applicable for a period of five (5) years	NA	Telangana New and Renewabl e Energy Developm ent Corporatio n Limited	Policy	NA	<p>1. The Solar Policy Cell (SPC) will undertake <b>single window clearance</b> for all SPPs.</p> <p>A <b>transaction charge</b> of Rs. 10,000/MW shall be applicable for processing applications for single window clearance with a maximum of rupees two lakhs per project.</p> <p>2. <b>Deemed conversion to Non-agricultural land status</b> on payment of applicable conversion charges and it is the responsibility of the project developer to acquire land for solar project.</p> <p>3. <b>Exemption from Land ceiling Act:</b> The ceiling limit as per the land ceiling act will not be applicable for any land acquisition for Solar Power Projects and Solar Parks.</p> <p>4. <b>Energy Banking :</b> Banking of <b>100% of energy</b> shall be permitted for all Captive and Open Access/ Scheduled</p>

					<p>consumers during all 12 months of the year and the <b>banking charges</b> shall be adjusted in kind @ <b>2%</b> of the energy delivered at the point of drawl.</p> <p>Banked units <b>cannot be consumed/redeemed</b> in the peak months (Feb to June) and in the peak hours (6 pm to 10 pm). The <b>unutilized banked energy</b> shall be considered as <b>deemed purchase</b> by DISCOM(s) at average pooled power purchase cost as determined by TSERC for the year.</p> <p>5. <b>Electricity duty</b> shall be exempted for captive consumption, sale to DISCOMS and third party sale in respect of all SPPs set up within the state. Also, Electricity duty will be waived <b>for the new manufacturing facilities</b> and ancillaries of the Solar Power Projects.</p> <p>6. <b>Exemption from Cross subsidy Surcharge</b> for SPP located within the state and selling power to third parties within the state for five years from the date of commissioning of the SPP.</p> <p>7. Solar Power Project using PV or solar thermal technology will be given required <b>clearances under pollution control laws</b> within a week by the TSPCB.</p>
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						<p>8. <b>Intra-state Open Access clearance</b> for the tenure of the project will be granted as per TSERC regulations amended from time to time. In absence of any response or intimation from Solar Policy Cell (SPC) to the generator within twenty one (21) working days, then such application shall be deemed to have been given open access</p> <p>9. <b>Refund of Stamp Duty</b> for land purchased for setting up solar power project and/or Solar parks.</p> <p>10. <b>Refund of VAT</b> for all the inputs purchased for solar power projects will be provided by the Commercial Tax Department <b>for a period of 5 years.</b></p>
Manipur Grid Interactive Rooftop Solar Photovoltaic (SPV) Power Policy 2014	NA	NA	The Manipur Renewable Energy Development Agency (MANIREDA)	Policy	NA	NA



The Mizoram Solar Power Policy, 2015	from the date of its notification in the State Gazette and until further order	achieve the Solar RPO of 10.5% by end of 2021-22, a minimum target of 80 MW	Zoram Energy Development Agency (ZEDA)	Policy	NA	<p>1. A <b>uniform wheeling charge</b> of 2% of the energy supplied to the grid or as determined by JERC M&amp;M, irrespective of the distance from the generating station.</p> <p>2. <b>Banking of Energy</b> produced for a period of one year for all Captive and Open Access/Scheduled consumers.</p> <p><b>Banking charges</b> shall be adjusted in kind @ 2% of the energy delivered at the point of drawal.</p> <p>The unredeemed banked energy shall be considered as <b>deemed purchase</b> by the Department / Distribution Licensee at <b>Average Pooled Power Purchase Cost (APPC)</b> as determined by JERC(M&amp;M) for the year.</p> <p>3. <b>Electricity duty</b> shall be <b>exempted</b> for all SPPs set up within the state. Also, Electricity duty will be waived for the new <b>manufacturing facilities</b> and ancillaries of the Solar Power Projects.</p> <p>4. <b>Bill settlement:</b> All transactions between the Department and the eligible producer involving wheeling, banking or sale of power will be settled on a monthly basis.</p> <p>5. <b>Exemption from Demand Cut:</b> A reduction in contract demand to the extent of 50% of installed capacity of the solar power plants shall be permitted by the Distribution Licensee,</p>
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					<p>in case the power plant is not utilizing the Department's grid for supply of power to the consumer.</p> <p><b>6. Power Purchase Agreement (PPA)</b> between the Distribution Licensee/Consumer and eligible producers for a minimum period of 10 years or for shorter period on the basis of merit of the case.</p> <p>7. The Distribution Licensee shall provide facilities of an irrevocable, divisible, revolving and confirmed standby <b>Letter of Credit</b> by any nationalized bank. The amount of the Letter of Credit shall be equal to the expected payment for two months by the Department.</p> <p><b>8. Deemed Pollution Clearances</b> for PV or solar thermal technology by Mizoram Pollution Control Board.</p> <p><b>9. Deemed Industrial status</b> to Eligible producers and incentives available to such eligible producers shall be available to solar power producers.</p> <p><b>10. Government Land for grid connected projects</b> would be made available to project developers depending on availability.</p>
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						<p>11. <b>Entry tax / VAT Exemption</b> on materials and equipment sold and purchased by nodal departments/agencies appointed by MNRE.</p> <p>12. <b>Refund of Stamp Duty</b> for land purchased for setting up solar power project and Stand-alone Solar Power System.</p>
Odisha Solar Policy-2013	NA	NA	Odisha Renewable Energy Development Agency	Policy	Odisha Renewable Energy Infrastructure Development Fund	<p>1. <b>Exemption from electricity duty:</b> A power plant Generating Power from Non-conventional Sources set up after the effective date shall be deemed to be a new industrial unit. These plants will not be liable to pay Electricity duty.</p> <p>2. <b>Land bank:</b> Government land earmarked for Industry under the “Land Bank” scheme and other Government land wherever applicable will be allotted for units generating power from Nonconventional Sources.</p>
Rajasthan Solar Energy Policy, 2011	19.4.2011 until superseded or modified.	10000 - 12000 MW in 10-12 years.	Rajasthan Renewable Energy Corporation Limited (RREC)	Policy	NA	NA

Tamil Nadu Solar Energy Policy, 2012	till 2015	3000 MW by 2015	Tamil Nadu Energy Developm ent Agency (TEDA)	Policy	NA	<p>1. <b>Net metering</b> facility will be extended to solar power systems installed in commercial establishments and individual homes connected to the electrical grid</p> <p>2. <b>Electricity Duty:</b> Exemption from electricity tax to the extent of 100% of electricity generated from solar power used for self-consumption/sale to utility will be allowed for 5 years.</p> <p>3. <b>Exemption from Demand Cut:</b> Exemption from demand cut to the extent of 100% of the installed capacity assigned for captive use purpose will be allowed.</p>
Uttarakhand Solar Energy Policy,2013	till 2017	500M W by 2017	Uttarakha nd Renewabl e Energy Developm ent Agency (UREDA)	Policy	NA	NA

**Annexure 3 - Combined Summary of Wind State Policy**

<b>NAME OF POLICY</b>	<b>OPERATIVE PERIOD</b>	<b>TARGET</b>	<b>FACILITATING AGENCY</b>	<b>REGULATION/POLICY/ACT/EXECUTIVE ORDER</b>	<b>FUNDS</b>	<b>INCENTIVES</b>
Andhra Pradesh Wind Power Policy, 2015	five (5) years (from 13.02.2015) and/ or shall remain in force till such time a new policy is issued.	NA	New and Renewable Energy Development Corporation of A.P. Ltd (NREDC AP)	Policy	NA	<p><b>1. Power Evacuation:</b> Wind power projects will be exempted from paying the <b>supervision charges</b> to APTransco/Discom towards the internal evacuation infrastructure within the wind farm site &amp; all electrical installations within wind farm site.</p> <p><b>2. Transmission and Distribution charges for wheeling of power</b> shall be charged as per regulations of APERC.</p> <p><b>3. Energy Banking</b> 100% of energy shall be permitted during all 12 months of the year subject to charges in kind @ 2% of the energy delivered at the point of drawal.</p> <p>Drawals from banked energy shall not be permitted during five (5) month period from 1st April to 30th June and 1st February to 31st March of each financial year.</p> <p>Drawals of banked energy during the Time of the Day (ToD) applicable during the peak hours, as specified in the respective</p>

					<p>Retail Supply Tariff Order, shall also not be permitted throughout the year.</p> <p>The unutilized banked energy shall be considered as <b>deemed purchase</b> by Discoms at the pooled power purchase cost as determined by the APERC for the applicable year.</p> <p>4. Intra-state <b>Open Access</b> clearance for the <b>whole tenure</b> of the project or 25 years whichever is earlier will be granted as per the APERC Regulations amended from time to time.</p> <p>5 All wind power projects are exempted from paying <b>Electricity Duty</b> in case of sale of power to APDiscom.</p> <p>6. <b>Deemed Public Private Partnership (PPP) Status</b> shall be provided for projects coming up under Category I and have entered into a PPA with APDiscom for sale of power.</p> <p>7. <b>Deemed Non-Agricultural (NA) status</b> for the land where wind power projects will be accorded, on payment of applicable statutory fees.</p> <p>8. Generation of electricity from wind shall be treated as eligible for <b>deemed industry status</b> under the schemes administered by the Industries Department and incentives available to industrial units under such schemes shall be available.</p>
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						<p>9. <b>Must run status:</b> Injection from wind power projects shall be considered to be deemed scheduled subject to prevailing regulations/grid code of appropriate commission.</p> <p>10. <b>Pollution Clearance :</b> Wind power projects will be exempted from obtaining any NOC/Consent for establishment under pollution control laws from AP Pollution Control Board.</p>
Wind Energy Policy,2006	remain in force until further revision	NA	Chhattisgarh State Renewable Energy Development Agency (CREDA)	Policy	NA	<p>1.The wind energy developer will be selected on the basis of an <b>open tender</b> for the installation of wind energy generators at "eligible site" identified by CREDA.</p> <p>2. Developer will be given the land use right for the installation of generator of the land within 25 Km radius of "eligible site".</p> <p>3. State Government or its nominated agency shall have the <b>first right to purchase</b> the electrical energy generated by the wind energy generator at the rate decided by CG ERC and developer has an option to sell to a <b>third party</b>.</p> <p>4. <b>Wheeling Charges:</b> Chhattisgarh State Electricity Board will undertake to transmit on its grid the power generated by the eligible developer and make it available to him for captive use or to the third party nominated by him, at the charges determined by the CG ERC.</p>

					<p>5. The <b>land use permission</b> for the land owned by the Government will be given to the developer for 30 years or period of project which- ever is earlier.</p> <p>6. If <b>private land</b> is required for the implementation of power projects then the option for its use will be one of the following: -</p> <p>(a) <b>Acquisition of land</b> will be carried out as per the ideal rehabilitation policy under Land Acquisition Act of the State Government, or</p> <p>(b) If landowner selects the option to give the <b>right to use</b> his land for the project to the developer then developer shall have to pay an annual rent of Rs . 5000/- per acre to the landowner. This rent will be increased @ 15% every three years. This arrangement will be in force for 30 years.</p> <p>7. Wind energy generating companies shall be treated as <b>‘industry’</b> and eligible for all the incentives for new industries, declared in the industrial policy of the Department of Industries of the Government of Chhattisgarh. Such firms will have to abide by the duties laid down in the industrial policy and in all the prevalent policies of the Government.</p>
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Gujarat Wind Power Policy 2016	from 02.08.201 6 till June 30 2021	NA	Gujarat Energy Developer Agency (GEDA)	Policy	NA	<p>1. Exemption from payment of <b>electricity duty</b> in accordance with provisions of Gujarat Electricity Duty Act 1958.</p> <p>2. <b>Demand cut Exemption</b> to the extent of 50% of installed capacity of Wind Power Project in case of captive consumption and third party sale.</p>
Wind Power Project Policy, 2012	from 21.02.201 3 till 25 years or the life of the project, whichever is earlier	NA	Madhya Pradesh Electricity Regulator y Commissi on (MPERC)	Policy	NA	<p>1. <b>No energy cess</b> shall be payable on the power supplied by wind power projects.</p> <p>2. <b>Industry Status:</b> Projects implemented under this policy shall receive the <b>status of industry</b> and shall be eligible for all the incentives provided under “Industrial Promotion Policy” of State government as amended from time to time.</p> <p>3. <b>Electricity Duty</b> for a period of 10 years for captive consumption and third party sale.</p> <p>4. <b>Wheeling Charges:</b> In case of power consumption for self-use or power sale to third party the MPPTCL or related State Discom shall facilitate wheeling of power at the rates prescribed by MPERC.</p> <p>5. <b>Energy Banking</b> of 100 % of energy in each financial year shall be permitted subject to some conditions.</p>

						6. The exemption from <b>VAT/Entry Taxes</b> for wind power plants shall be available in accordance with prevailing notification.
Policy for Promoting Generation of Electricity from Wind, 2012	from 18.7.2012 and will remain in force until superseded or modified by another Policy	NA	Rajasthan Renewable Energy Corporation Limited (RREC)	Policy	NA	<p><b>1. Exemption from Electricity Duty-</b> The energy consumed by the Power Producer for his own captive use under clause 4.2 will be exempted from payment of the electricity duty.</p> <p><b>2. Grant of incentives available to industries-</b> Generation of electricity from Renewable Energy Sources shall be treated as eligible industry under the schemes administered by the Industries Department and incentives available to industrial units under such schemes shall also be available to the Developer/Power Producers.</p>

**Annexure 4 – Combined Summary of Biomass State Policy**

<b>NAME OF POLICY</b>	<b>OPERATIVE PERIOD</b>	<b>TARGET</b>	<b>FACILITATING AGENCY</b>	<b>REGULATION/POLICY/ACT/EXECUTIVE ORDER</b>	<b>FUNDS</b>	<b>INCENTIVES</b>
Madhya Pradesh Bio-mass based Electricity (Power) Project Implementation Policy 2011	NA	NA	Madhya Pradesh Urja Vikas Nigam Limited (MPUVNL)	Policy	NA	<ol style="list-style-type: none"> <li>1. <b>Electricity Duty and Energy Cess</b> exempted for a period of 10 years from the date of commissioning of the project.</li> <li>2. Subsidy of 4% shall be provided by the state government on <b>wheeling charges</b> as determine by MPERC for a period of 10 years from date of commission of project.</li> <li>3. Projects under this policy shall receive the <b>status of industry</b> and shall be eligible for all the incentives under the Industrial Promotion Policy.</li> <li>4. The equipments procured before the commissioning of the biomass power project will be <b>exempted from entry tax</b>.</li> <li>5. <b>Contract Demand Reduction:</b> The Industrial units which are the consumers of MPSEB/Subsequent Company, <b>shall install biomass based power plants</b> for Captive use or purchase power generated from biomass sources as third</li> </ol>

						<p>party, shall be provided the facility of contract demand reduction.</p> <p><b>6. Water availability for power generation</b> at the prevailing rates of Narmada Valley Development Authority or at the rates determined by the State Government.</p> <p><b>7. Wheeling and Transmission Charges</b> would be provided by the MP Power Transmission Co. Ltd. as decided by MP ERC.</p> <p><b>8. Third Party Sale</b> in accordance with the related provisions of Electricity Act, 2003 and orders/regulation issued thereunder.</p> <p><b>9.</b> Developers to receive <b>carbon credit benefits</b> as per the guidelines of MP ERC.</p>
Policy for Promoting Generation of Electricity from	from 26.02.2010 and will remain in force until superseded	NA	Rajasthan Renewable Energy Corporation Limited (RREC)	Policy	NA	<p><b>1. Exemption from Electricity Duty:</b> Consumption of electricity generated by Power Producers for its captive use will be exempted from Electricity Duty @ 50% for a period of 7 years from COD.</p> <p><b>2. Grant of incentives available to industries:</b> Generation of electricity from Renewable Energy Sources shall be treated as eligible industry under the schemes administered by Industries Department and incentives available to</p>

Biomass, 2010	ed or modified by another Policy					industrial units under such schemes shall also be available to the Power Producers.  <b>3. Land on Concessional Rate:</b> The Government land required for Biomass Power Plant shall be allotted to Power Producer at concessional rates of 10% of DLC rates.
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