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**ENERGY INFRASTRUCTURE AND QUEST FOR ENVIRONMENT  
PROTECTION: A STUDY OF LEGISLATIVE FRAMEWORKS**- Keshav Jha<sup>1</sup>**Abstract**

The energy infrastructure and environment are closely related as all the infrastructural growth whether be it exploration, production and any related aspects, ultimately affects the lands, the mountains ecology, the sea life, affecting air quality and other related aspects. It is a fact that our energy activities including exploration, production, consumption is continuously affecting the environment. In the recent past we have had some incidents like Vizag gas leak, Baghjan oil field fire and many such incidents have happened in past which has caused maximum harm to the natural environment. Environmental clearances, waste management post operations etc. remains another controversial area for the related to energy infrastructure projects.

**Introduction**

With all such development at hand, this paper tries to find reasonable connection between the utilisation of energy and its effects on the ecology, maritime environment and all. The paper tries to analyse different energy legislations their source, principles and what they provide for environment protection and conservation. The research paper also tries to present a comparative study of the legislative framework of countries link Australia and Canada and study the international charters/treaties which provides for environment clearances norms. The paper compares the laws and government policies in place which regulates the energy sector and put emphasis on the provisions for the environment protection. The paper also presents a judicial approach towards energy-environment mitigation. The research paper in the end makes conclusions, summarising all the discussions and tries to propose some suggestions towards sustainable and secured India in terms of Energy.

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## **Energy and Environment Governance in India**

As Energy law focuses on making energy widely available at reasonable cost, and environmental law focuses on preventing pollution. As a result of these differences in their respective orientations, the two fields often work incoherently and even in conflict. The chapter provides an insight to energy laws, the idea of environment protection and how are they related and are in conflict with one another.

With the rapid increase in population and economic growth, the demand for better quality and quantity of energy sources have also increased at an alarming rate in the country.

### **Environment Governance**

The environmental governance of any sector in the country is mainly done through Ministry of Environment, Forest and Climate Change (MoEFCC) which is the nodal Ministry for implementing and facilitating environmental regulations. *“The common understanding among these governing institutions is that these renewable energy projects have insignificant impact on the environment, the negative environmental externalities from such projects are reversible in nature and can be minimized by proper environmental management plan.”*<sup>2</sup>

### **Legal Framework for Environmental Clearances**

The environmental permitting is done through Environmental Impact Assessment (EIA) which is a mechanism to evaluate the environmental impacts of a project while taking into consideration the socio-economic, cultural and human-health impacts. Since these projects (wind and solar projects) have no negative impact on the environment, they are kept outside the purview of EIA i.e. no stringent scrutiny of such projects are required. Wind and solar power projects are not mentioned in Schedule I of the 2006 EIA Notification which specifies projects or activities requiring prior environmental clearance and hence these are exempted from obtaining Environmental Clearances.

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<sup>2</sup>MINISTRY OF NEW AND RENEWABLE ENERGY, Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Project (2013) <https://mnre.gov.in/sites/default/files/uploads/report-on-developmental-impacts-of-RE.pdf>.

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As per the Environmental Impact Assessment (EIA) Notification, 2006 given by the MoEFCC solar photovoltaic power and wind energy projects are kept beyond the ambit of EIA which is to mean that no environmental clearances are required for such renewable projects.<sup>3</sup>

A Pollution Index criteria has been developed by MoEFCC for categorization of air pollutants, water pollutants, waste generation and consumption of resources of the industrial sector. Under it, the renewable projects are specified in “White category” which are not required to obtain Consent to Establish or Consent to operate from the concerned State Authorities.<sup>4</sup>

Other environmental governance aspect includes that of pollution, forest clearances and land acquisition. Pollution control is a state subject under the Indian Constitution and hence, the State Pollution Control Board is considered to be the competent authority for granting Consent to establish and Consent to operate to such industries.<sup>5</sup> The requirement to issue CTE is to evaluate the potential environmental impacts and pollution control installations, while the CTO is issued after fulfilling the sectorial specific standards of the projects with regard to emissions. For renewable projects, such consents are not required.

### **Land & Forest Clearances**

For obtaining forest clearances, the Act of 1980, was enacted which aimed at curbing deforestation of land by restricting the conversion of land from forested area to non-forest area.<sup>6</sup> Since the Renewable energy projects are of utmost national importance, the forest land can be granted on lease by the Ministry of Environment, Forest and Climate Change (MoEFCC) after obtaining necessary approvals from the various departments of the government hierarchy. In India, the procedure for acquiring land for developmental projects is carried out through the Right to Fair Compensation and Transparency in Land Acquisition,

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<sup>3</sup>PRESS INFORMATION BUREAU, Amendment in EIA Notification, 2006 on Integration of Environment Conditions with Building Permissions, <https://pib.gov.in/newsite/PrintRelease.aspx?relid=155550>. (24<sup>th</sup> Nov 2020).

<sup>4</sup>SHAKTI FOUNDATION, Addressing Land Issues for Utility Scale Renewable Energy Deployment in India (2017) <https://shaktifoundation.in/wp-content/uploads/2018/01/Study-Report-Addressing-Land-Issues-for-Utility-Scale-Renewable-Energy-Deployment-in-India.pdf>.

<sup>5</sup>*Supra* note 1.

<sup>6</sup>Forest Conservation Act, 1980.

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Rehabilitation and Resettlement Act, 2013 and the Resettlement and Rehabilitation (R&R) Policy, 2007 provides for minimum displacement to occur in large scale projects.

Since Article 246 of the Indian constitution states that land is a state subject, thus the procedure to procure, acquire or lease land is a time consuming and tedious process with each state having its own set of laws for the same. The problems and challenges faced due to scarce availability of land is expected to increase tremendously in the future years as the demands from other sources of economy is also increasing tremendously. The main challenge for such projects is with respect to the availability of land. Obtaining the required environmental clearances from different departments such as, Ministry of Environment and Forest, Department of Forests and other bodies is also considered to be a hurdle after the identification and selection of desired land is taken place. Few other land acquisition problems are regulatory delays, disposal of waste, concerns over loss of land, environmental concerns, and unavailability of sufficient infrastructure and high cost of land.

### **Law & Policy Framework towards Clean Energy and Safe Environment**

As we have already discussed, the energy demand is not going to reduce and it should not reduce to. One of the yardsticks for the measurement of the progress of a nation is also the energy consumption in that country. Since other traditional sources like coal and projects related to are not only damaging the atmosphere but the lands too. So the clean energy is the only alternative this world has if it want to survive. The governments too are working over it though that is not enough in the proportion of damage being done. The India government has decided to meet 175 GW of its energy demand from the renewables. In this direction several states have framed policies related to solar project and wind projects. Let's talk about them one by one.

#### **➤ National Electricity Policy 2005**

The 2003 electricity act requires the central government to frame a national electricity policy. The 2005 policy which got formulated focus on the development of the non-conventional sources in order to reduce the environmental concerns. If we refer the various paragraphs of

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the policy it has been stipulated that non-conventional are eco-friendly.<sup>7</sup> It further states that there is an urgent need to shift to such sources. In order to achieve the same, it has been suggested that India must reduce the capital cost of non-conventional energy projects.

#### ➤ **Tariff Policy 2006**

Again, in order to fulfil the statutory requirement provided in the 2003 act, a tariff policy is also formulated. The 2006 policy, in order to obligate the states and distributors has provided for the compulsory renewable purchase obligation. It is stated that a minimum sum of electricity requirement has to be made from the renewable sources. The case of Hindustan Zinc<sup>8</sup> is most discussed in this direction. Here the Rajasthan state electricity regulatory board has brought in two regulations which required for compulsory renewable purchase. This was challenged in courts. The Supreme Court in finally adjudicating the matter observed that some strict measures must be taken in order to meet the constitutional obligation of clean and safe environment as mandated by the directive principles. The court upheld the validity of the regulations.

#### ➤ **Solar Policies**

**Andhra Pradesh Solar Power Policy, 2013:** Under this policy the primary objective of the state government is to meet the energy security concerns along with the clean energy considerations. It also aims at promoting widespread usage of solar power and to set up minimum renewable targets for the future years in the state in order to meet the energy demands in a more efficient and sustainable manner and also, to focus on development of various solar parks with the adequate infrastructure facilities which shall also encourage other project developers to set up such power projects in the State and to enhance equitable distribution of electricity.<sup>9</sup>

For the purposes of acquisition of land, the project developer has been assigned the responsibility of acquiring the land according to the prevailing policies and frameworks as

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<sup>7</sup>Paragraph 5.12, National Electricity Policy, 2005.

<sup>8</sup>Hindustan Zinc Limited Udaipur vs The Rajasthan Electricity Regulatory Commission on 29 August, 2016.

<sup>9</sup>MINISTRY OF NEW AND RENEWABLE ENERGY, <https://mnre.gov.in/file-manager/UserFiles/state-power-policies/AP-Solar-Power-Policy.pdf>. (24<sup>th</sup> Nov 2020).

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facilitated by the state nodal agency. The solar projects are exempted from the payment of any fees as they acquire Non Agriculture status. The “Consent to Establish” is also not required by the State Pollution Control Board to set up solar photovoltaic power projects.<sup>10</sup>

**Rajasthan Solar Energy Policy, 2011:** The main goal of the policy is to establish Rajasthan as “*a national leader in solar energy*” by developing the state as global hub for solar plants to meet the energy demands. Other objectives of the policy includes reducing the carbon emissions in the state and thereby contributing to energy and ecological security; provide for a sustainable scheme to meet the energy demands; prevent dependence on the conventional sources of energy; make use of wastelands in an efficient manner; Generation of large scale employment opportunities and provide for proper research and development of various solar techniques.<sup>11</sup>

Recently in March 2019, farmers and localities of the Bhadla Solar Park were protesting against the official and claimed that the land belong to them which resulted in delay for the commission of projects.<sup>12</sup> The irony is that the entire area is government land, yet there are people who have been living there since ages and now need money for their relocation to other places. Also, required grid infrastructure is not even available for the projects and there is scarcity of pooling substations.<sup>13</sup>

**Karnataka Solar Policy 2014-2021:** This policy is formulated by amending the Karnataka Land Reforms Act, 1961 to facilitate the setting up of solar power plants in the state. It provides for time bound permissions to project developers and the Deputy Commissioners has been empowered to approve purchase of agricultural land for development of renewable projects.<sup>14</sup>

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<sup>10</sup>SHAKTI FOUNDATION, Addressing Land Issues for Utility Scale Renewable Energy Deployment in India (2017) <https://shaktifoundation.in/wp-content/uploads/2018/01/Study-Report-Addressing-Land-Issues-for-Utility-Scale-Renewable-Energy-Deployment-in-India.pdf>.

<sup>11</sup>MINISTRY OF NEW AND RENEWABLE ENERGY, Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Project (2013) <https://mnre.gov.in/sites/default/files/uploads/report-on-developmental-impacts-of-RE.pdf>. (24<sup>th</sup> Nov 2020).

<sup>12</sup>SaamyPrateek, Solar Projects facing land challenges in Rajasthan’s Badla Park, MERCOM INDIA (Oct 21 , 2019) <https://mercomindia.com/solar-projects-land-issues-bhadla-solar/>.

<sup>13</sup>*Id.*

<sup>14</sup>Section 109, Karnataka Land Reforms Act, 1961.

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The main idea behind the policy is to transform Kerala into an investor friendly state by using the readily available solar technologies and thereby, encouraging public private partnership in this sector.<sup>15</sup> It also promotes usage of wastelands for the installation of solar projects to ensure equitable distribution throughout the state.

Though the state has developed a time bound solar policy for generation of renewable energy, a case study in the Tumakuru district was conducted to know the concerns of the local community where projects are installed. It was found out that the farmers are unhappy as they are concerned about their future prospects. Giving up their land to government is giving up their standard of living.<sup>16</sup> They are majorly aggrieved of the fact that though the projects are set up for mass generation of electricity but they lack access to the same in their homes. These huge installations would also require adequate water supply which is not readily available in the state. Such issues are yet to be pondered upon by the officials of the state.

**Gujarat Solar Power Policy, 2015:** The main reason behind promoting renewable sector is that the state intends to provide clean and green sustainable environment to all its citizens through reduced fossil fuel consumptions. Since, the state has a large amount of barren and uncultivable land; the same can be used effectively for the installation of solar power plants. This would not only help to create better employment opportunities in the state but also promote investments in the renewable energy sector.<sup>17</sup>

Gujarat was considered to be a favoured spot for wind projects because it has many available sites, especially in the Kutch area, where wind speeds are very high. However, over several months, the condition is not same as the state has been reluctant in leasing land thereby resulting in developers to buy private land which is a much expensive alternative.<sup>18</sup>

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<sup>15</sup>MINISTRY OF NEW AND RENEWABLE ENERGY, Solar Policy 2014-2021, [https://mnre.gov.in/file-manager/UserFiles/state-power-policies/Karnatava-Solar-Power-Policy\\_2014-2021.pdf](https://mnre.gov.in/file-manager/UserFiles/state-power-policies/Karnatava-Solar-Power-Policy_2014-2021.pdf). (24<sup>th</sup> Nov 2020).

<sup>16</sup>PrajwalBhat, Towards an uncertain future: Why farmers are unhappy with Karnataka's big bet on solar, THE NEWS MINUTE(1 JAN, 2019) <https://www.thenewsminute.com/article/towards-uncertain-future-why-farmers-are-unhappy-karnataka-s-big-bet-solar-93992>.

<sup>17</sup>MINISTRY OF NEW AND RENEWABLE ENERGY, Gujarat Solar Power Policy- 2015 <https://mnre.gov.in/file-manager/UserFiles/state-power-policies/Gujarat-Solar-Power-Policy-2015.pdf>.(24<sup>th</sup> Nov 2020).

<sup>18</sup>KaavyaChandrasekaran, Wind projects exit Gujarat as leasing land gets tougher, ECONOMIC TIMES, (March 10, 2019) <https://economictimes.indiatimes.com/industry/energy/wind-projects-exit-gujarat-as-leasing-land-gets-tougher/articleshow/68349089.cms?from=mdr>.

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Besides these policies framed by different states, Ministry of New and Renewable Energy (MNRE) have also issued a “Solar Parks Scheme” under which large area of land is identified for the purpose of setting up of solar power projects where the project developers are provided land with statutory clearances along with a common infrastructure facility to set up projects under a ‘Plug and Play’ business model.<sup>19</sup>

### **Judicial Approach**

#### **Recent Case Study on fixing liability: Baghjan Gas Leak Case & Vizag Incident**

Lately, rapid industrialization and especially the manufacturing sector have contributed majorly to environmental pollution.<sup>20</sup> With time it has been realized that these industries too are the social units having duties towards ensuring environmental conservation and maintaining public health conditions. The polluter pays principle works on the same line.

The polluter pays principle requires the polluter to meet the costs of the pollution control and prevention measures. It states that polluters should bear the expenses of preventing and controlling pollution to ensure that environment is in an acceptable and clean state. Put simply, it imposes liability on a person who pollutes the environment to compensate for the damage caused to the environment.<sup>21</sup>

### **The Principle**

The Principle was recommended in 1972 by the World Commission on Environment and Development as an economic measure to internalize environmental costs. Organization of

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<sup>19</sup>MINISTRY OF NEW AND RENEWABLE ENERGY, National Solar Mission Division, <https://mnre.gov.in/sites/default/files/webform/notices/OMModificationSolarpark%20Scheme09-03-2019.pdf>. (24<sup>th</sup> Nov 2020).

<sup>20</sup>THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE REPORT, Global warming of 1.5°C, <https://www.ipcc.ch/sr15/>. (29<sup>th</sup> Nov 2020).

<sup>21</sup>The Polluters Pay Principle and the Supreme Court of India, Indian Law Institute, [http://14.139.60.114:8080/jspui/bitstream/123456789/17813/1/027\\_The%20Polluter%20Pays%20Principle%20and%20the%20Supreme%20Court%20of%20India%20%28108-116%29.pdf?source=app](http://14.139.60.114:8080/jspui/bitstream/123456789/17813/1/027_The%20Polluter%20Pays%20Principle%20and%20the%20Supreme%20Court%20of%20India%20%28108-116%29.pdf?source=app). (29<sup>th</sup> Nov 2020).

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Economic Cooperation and Development (OECD) was the first to introduce the said principle in 1972 itself.<sup>22</sup>

In context to International Law, it found space in principle 21 and 22 of the Stockholm Declaration, 1973 and in Principle 15 and 16 of the United Nation Conference on Environment and Development, 1992.<sup>23</sup>

Principle 15 provides says, *“In order to protect the environment, the precautionary approach shall be widely applied by states according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation”*.<sup>24</sup>

Principle 16 stated, *“National authorities should endeavour to promote the internalization of environmental 42 costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment”*.<sup>25</sup>

It was after the Stockholm Declaration of 1972 that India formulated a wide range of laws for environment protection which includes the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Forest (Conservation) Act, 1980, but the polluter pays principle in India was made applicable by the courts through various judgments.

### **Judicial interventions in India**

In environmental jurisprudence, the theory of absolute liability in the cases of environmental injury has found legal validation only because of the polluter pays principle. Theory of

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<sup>22</sup> THE POLLUTER-PAYS PRINCIPLE, Organisation for Economic Co-Operation and Development, Paris 1992,

[http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=OCDE/GD\(92\)81&docLanguage=En#:~:text=The%20Polluter%20Pays%20Principle%20\(PPP,the%20costs%20of%20pollution%20control.&text=Generally%20speaking%20a%20polluter%20has,any%20pollution%20that%20he%20originates. \(29<sup>th</sup> Nov 2020\).](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=OCDE/GD(92)81&docLanguage=En#:~:text=The%20Polluter%20Pays%20Principle%20(PPP,the%20costs%20of%20pollution%20control.&text=Generally%20speaking%20a%20polluter%20has,any%20pollution%20that%20he%20originates. (29<sup>th</sup> Nov 2020).)

<sup>23</sup>UNITED NATIONS, Rio Declaration on Environment and Development 1992, [\(29th Nov 2020\).](https://www.jus.uio.no/lm/environmental.development.rio.declaration.1992/portrait.a4.pdf)

<sup>24</sup>Principle 15, United Nation Conference on Environment and Development, 1992.

<sup>25</sup>Principle 16, United Nation Conference on Environment and Development, 1992.

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absolute liability says that a party/company in a hazardous industry cannot claim any exemption. It has to mandatorily pay compensation, whether or not the disaster was caused by its negligence.

One can find the principle of absolute liability enshrined under section 17 of the National Green Tribunal Act 2010. The provisions say that the tribunal can apply the provision of absolute liability even if the disaster caused is due to an accident.

For the first time, though inexplicitly, the Supreme Court applied this principle in Oleum gas leakage case. The Court held: “.....an enterprise engaged in a hazardous or inherently dangerous industry which poses a potential threat to the health and safety of persons working in the factory and to those residing in the surrounding areas. It owes an absolute and non-delegable duty to the community to ensure that no harm results to anyone on account of the hazardous or inherently dangerous nature of the activity which it has undertaken. The enterprise is absolutely liable to compensate for such harm and irrespective of all reasonable care taken on his account”.<sup>26</sup>

Once again, the Supreme Court reiterated the principle of absolute liability based on the polluter pays principles in the matter of Indian Council for Enviro-Legal. The apex court held: “...once the activity carried on is hazardous or inherently dangerous, the person carrying on such activity is liable to make good the loss caused to any other person by his activity irrespective of the fact whether he took reasonable care while carrying on his activity”.<sup>27</sup>

Again in the Vellore tanneries pollution case the Supreme Court elaborated the concept of the polluter pays principle. The court observed: “...polluter pays principle means the absolute liability for harm to the environment extends not only to compensate the victims of pollution but also to the cost of restoring the environmental degradation”.<sup>28</sup> The court further said that “remediation of the damaged environment is part of the process of sustainable development”.<sup>29</sup>

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<sup>26</sup>MC Mehta v. Union of India, 1987 AIR 1086

<sup>27</sup>Indian Council for Enviro-Legal Action v. Union of India 1996 AIR 1446 SC.

<sup>28</sup>Vellore Citizens Welfare Forum v. Union of India on 28 August, 1996.

<sup>29</sup>Id.

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### Current Application

The principle was recently applied by the National Green Tribunal in the case of BonaniKakkar v. Oil India Limited also known as the Baghjan Gas Leak Case. On 27 May 2020, Baghjan gas well in Assam's Tinsukia district started leaking. Thousands of people and nearby villages were evacuated. On 9 June, the well caught fire and it continues to blow out till now. The incident has created a deep impact on the nearby environment.<sup>30</sup>

The green court constituted an expert committee to investigate into the matter and share the findings. The committee revealed that OIL had flouted the norms enshrined under the Environment Impact Assessment Notification 2006, the law which is responsible for granting environmental clearances to the development projects.

Based on the recommendations of the expert committee, NGT ordered OIL to pay interim compensation ranging from Rs. 2 lakhs to Rs. 25 lakhs to the ones who were affected by the incident based on the polluter pays principle.

Similarly, earlier this year in May, an unfortunate industrial disaster happened in the city of Vizag in Andhra Pradesh. A chemical plant operated by the South Korean company, LG Polymers, got leaked and killed 11 people. NGT constituted an expert committee to probe the incident. It was once again found that the units were being operated by LG Polymers in violation of several environmental clearance provisions.<sup>31</sup>

It was also noted that gas leak was caused due to non-compliance by the company to Manufacture, Storage and Import of Hazardous Chemical Rules 1989, which requires a company to maintain both onsite and offsite plans to ensure prevention of damage in emergency situations.

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<sup>30</sup>BonaniKakkar v. Oil India Limited, NGT, Original Application No. 43/2020(EZ).

<sup>31</sup>LG Polymers India v. Union of India, NGT Order, Original Application No. 73/2020.

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Based on the suggestions of the expert committee, NGT imposed a penalty of Rs. 50 crores on the company. The court also observed that the company was under the strict and absolute liability for the environmental damage and consequential loss of life and public health.<sup>32</sup>

The green court made it clear in its order that the companies are liable to restore the harm caused to the environment and reinstated the observation made in the Vellore Citizens Welfare Forum case. It reaffirmed that even in the absence of statutory recognition; the polluter pays principle is enshrined in the environmental law jurisprudence and very much applicable to a case like this.<sup>33</sup>

### **Energy, development and International environment laws**

The chapter discusses the importance of energy use and production to environmental law, and considers possible future developments so as to ensure that energy use and production are consistent with environmental objectives. The chapter present an insight to the crucial role that energy have in terms of development, the chapter talks about the framework we have at the international level that talks about the protection of environment in terms of energy infrastructure.

The Geneva Convention has been the facilitator for the development of the national regulatory regime for many countries where it comes to keep a check and control on the exploration of oil and other petroleum resources from the continental shelf. It requires the countries to take safety measure in the declared safe zones in order to protect the living resources.<sup>34</sup> Similarly there is a provision in the High sea convention which requires the states to make regulation in order to prevent any pollution occurring from the pipelines or while the exploration of the seabed.<sup>35</sup> Moving ahead the convention on law of the seas 1982 provided for the countries to make rules and to make some standards to reduce the pollution occurring from the seabed projects in their respective jurisdictions.<sup>36</sup>

So in the initial years the major focus of the environmental protection were sea and exploration activities occurring in the sea bed only. Like UK with bringing the Continental Shelf Act of 1964, recognised that any owner who allow the oil to escape or spill in the ocean while any exploration

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<sup>32</sup>*Id.*

<sup>33</sup>Gautam Kumar, Assam's Baghjan and Vizag's LG Polymers gas leak tragedies: Making the polluter pay for environmental damage, SDC Foundation, 27 Aug 2020, <https://sdcuk.in/assams-baghjan-and-vizags-lg-polymers-gas-leak-tragedies-making-the-polluter-pay-for-environmental-damage/>. (29<sup>th</sup> Nov 2020).

<sup>34</sup>Article 5 (7), Geneva Convention on the Continental Shelf, 1958.

<sup>35</sup>Article 24, Convention on the High Seas 1958.

<sup>36</sup>Article 208, Convention on law of the sea, 1982.

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activities will be treated as the criminal offence. Norway in the same year followed the same. Another legislation which served as the model law for decades was the Petroleum (Production) Regulation 1976. The law majorly focus on the offshore activities and degradation related to it.

### **Conclusion - A sustainable energy future for India**

The development of Renewable Energy resources is considered to be important in the country not only because of their inherent nature of providing cleaner energy but also because of the socio economic benefits of providing energy access and energy security to the remote areas. The key driving forces for the development of such resources are: high potential of energy from solar and wind sources, reduction in emissions, energy security interest and clean energy goals of the country.

What needs to be considered is that development should not happen at the cost of environment. In another terms, evolution of energy should not be achieved at the cost of degradation of environment. There is a need to have a structured environmental and social governance mechanism to monitor the sectorial activities. Though the legislative framework of the country is adequate except for controversial draft EIA presented by the Ministry of Environment for the clearances which also includes energy infra projects. The problem may arise in the future with regard to environmental concerns or the loss of biodiversity and pastoral activities which might happen when a large part of the country's land is used primarily for generation of energy.

Though there are concerns on waste management of the renewables but keeping in view the energy security concerns and the commitment to "*low carbon growth strategy*<sup>37</sup>" the best alternative available is to use the Renewable energy in an efficient manner. Renewable energy projects are considered to be cleaner sources of energy generation options in relation to conventional sources of energy. Since they have zero dependence on fossil fuels, they are a preferred choice in comparison to that of the conventional sources. They have much lower carbon dioxide emission content than that compared to that of coal or natural gas based energy generation. Though wind energy projects or solar projects are not entirely emission free but the amount of toxic emissions is relatively lower than that of fossil fuel based energy

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<sup>37</sup>TERI, Renewable Energy and Green Growth in India, <https://www.teriin.org/projects/green/pdf/National-RE.pdf>. (24<sup>th</sup> Nov 2020).

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generation. Amongst wind and solar energy projects, wind energy projects are kept at a higher pedestal as they can perform in any time of the day unlike the solar projects which can work only during the day time.

Renewable energy not only solves the sustainability problems associated within the energy market but is also non exhaustible, cost effective and relatively cleaner form of energy. The need for such transition from the conventional sources of energy to renewable energy was recognized way back in 1980s. In the present era, modern renewable energy is widely used in four different markets: “*power generation, heating and cooling, transport, and rural/off-grid energy services*”<sup>38</sup>. The Ministry of New and Renewable energy has been a Nodal Ministry for implementing and facilitating new and renewable energy projects for meeting the energy requirements of the country.<sup>39</sup> The India targets to achieve 175 GW of its electricity consumption from renewable sources till 2022. Within the renewable basket, 100 GW from solar, 60 GW from wind, 10 GW from Biomass and 5 GW from small hydro is estimated to be achieved. Two years remaining to achieve the target, India has secured around 83 GW till date. One aspect is that we try to thrive for renewables more and more and meet the energy target.

The another discussion is the though the renewables can decrease the environmental degradation but the manner in which these projects is being setup is also matter of concern. Like for the establishment of the solar park, one need hue area of land. Soon after the inauguration of India’s largest solar park in Rewa, Madhya Pradesh some voice of protest in terms of land accusation is being heard and same in many projects of the Gujarat government. Another discussion is related to the completion of the project. What will happen to the land? Will that be reusable for agricultural purposes? So disposal of waste also remain important. More emphasis can be given to the waste to energy projects too to generate energy from the waste. The Indian Institute of Petroleum, Dehradun has started one such project. This need to develop at a nation wide level.

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