



For Citation: Onifade, T.T.2015. India's Renewable Energy Scheme: Policy Response to Environmental Challenges. JWHSD, 1, 1-15. Available at: <http://wwhsdc.org/jwhsd/articles/>

INDIA'S RENEWABLE ENERGY SCHEME: POLICY RESPONSE TO ENVIRONMENTAL CHALLENGES.

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Abstract

The article analyses the stages of India's renewable energy (RE) policy cycle. It provides an answer to the question of whether or not India's RE policy framework is comprehensive and successful. In answering this question, it employs qualitative methods, and relies on primary and secondary sources. The study establishes that India's RE policy exhibits effectiveness, functionality, and equity, but lacks efficiency and sufficient political support. It concludes that the components of India's RE policy phases, though near complete and successful, are blurred with no clear distinctions, and cut across several decades.

Keywords: renewable energy; policy; India; energy; environment

1. Introduction

India is one of the fastest growing economies in the world, and this places enormous energy demands on its resources (Bajpai and Sachs, 2005). The country is a notable importer of petroleum products, and has statistics showing it as the fourth largest energy consumer as at 2011, and of crude oil and petroleum products in the world as at 2013 (US Energy Information Administration, 2013). There is no gainsaying this considering the country is one of the two in the world with a population of over one billion (Government of India, 2011).

In addition to the threat of energy depravity, a growing number of empirical studies have identified increased environmental problems in India, and their effects on livelihoods. Some scholars have linked the declining standard of living of Indians to pollution, claiming its consequences include climate change (Greenstone and Hanna, 2011). Other scholars have traced increased natural disasters in India directly to climate change (Thomas *et al.*, 2012); yet, some other scholars have identified the effect of climate change



on India's agriculture, and particularly rain-fed crops, and discovered the worst effect on small scale farmers (Asha, *et al.*, 2012).

Pollution and climate change threaten the livelihood of Indians in the face of inadequate adaptive mechanisms (de Fraiture *et al.*, 2007). They have serious consequences on the country's dense population. Perhaps, averting the consequences of pollution is the reason India specifically committed to the idea of a "Long Term Cooperative Plan" in the Bali Action Plan, that its per capita emission would not exceed those of developed countries (MEF, Government of India, 2009). The country has since reflected these environmental protection commitments in its development policies, and believes it can best meet its energy needs in a responsible, eco-friendly and sustainable manner by making suitable policies (Vijay *et al.*).

This paper describes the framework of India's RE policy. It provides an answer to the question of whether or not India's RE policy framework is comprehensive and successful. It establishes that India's RE policy exhibits effectiveness, functionality, and equity, but lacks efficiency and sufficient political support. In doing this, it employs the policy cycle and uses qualitative methods, and relies on primary sources such as statutes, and secondary sources including books, articles, and research surveys. The paper concludes that the components of India's RE policy phases, though near complete and successful, are blurred with no clear distinctions, spanning several decades.

2. India's Renewable Energy Policy

The literature shows that India's RE policy has passed through five phases: Agenda setting, formulation and legitimization, decision making/legislation, implementation, and assessment.

1.1. Agenda Setting



RE became India's agenda through environmental and energy concerns. To show commitment to the United Nations Conference on the Human Environment (UNCHE) which the country attended, and in response to the threats of industrialization, India's earlier environmental goals were to protect water and air quality, and the country's federal government took steps in this respect (Greenstone *et al.*, 2011). Empirical studies show that the country successfully curbed air pollution but not water pollution: results revealed further that the use of catalytic converters contributed to making air pollution control effective (Greenstone *et al.*, 2011). This established to the government that the less carbon-emitting energy consumed, the cleaner the environment became—a feature inherent in RE.

The Bhopal disaster of 1984 which led to the death of thousands and injury of over a hundred thousand people including successive generations refreshed people's minds about environmental risks (Browning, 1993; Peterson, 2008; Izarali, 2013). Particularly, it revealed the need for power sources in community-based industrial operations to be safer and cleaner (Broughton, 2005).

Also, energy statistics showed that India would reach a total domestic energy production meeting 71% expected energy consumption by 2016-2017, and 69% of expected energy consumption by 2021-2022. The statistics estimated that the country would meet the 29% balance in 2016-2017 by importing energy-equivalent of 267.8 MTOE, and the 31% balance by 2021-2022 by importing energy-equivalent of 375.6 MTOE (CSO, NSO, MSPI, Government of India, 2013). These estimates reveal that India's energy imports might increase as the years go by. The country's current energy capacity cannot power its growth rate (Arora, 2010). Energy demand is likely to increase at the rate of 7.5% in the future (Kaur, 2012: 625). India is also concerned that fossil fuel costs are rising (MNRE, 2011: 6). Again, it is predominantly rural, but has found it difficult to extend power to remote areas lacking grid and road infrastructures (IEA, 2012; Arora 2010).



These facts manifested economic, environmental, security, and general sustainability implications. More people became deprived of energy following an increased pressure on national economic means, mainly India's natural resources; increased rural-urban migration led to congestion of cities, and pressure on the environment and its resources; and increased reliability on foreign energy markets resulted in increased vulnerability.

In 1981, India's Federal government fully acknowledged the country's energy and environmental challenges, and the potential solutions found in reducing, and substituting where possible, the consumption of fossil fuel. In that year, it established the Commission for Additional Sources of Energy (CASE) to find alternative sources of energy, and put it under the supervision of the Department of Science and Technology (Bhattacharya and Jana, 2009; Chaturvedi, 1997). The department discovered RE as a viable non-conventional and alternative energy for India, and developed the agenda for promoting it with research and development (Chaturvedi, 1997; Bhattacharya and Jana, 2009).

Being a commission constituted by the government, the recommendations and activities of CASE officially established RE as a government business, hence putting it in the government's agenda. India's Federal government has since believed that RE would help meet India's economic and environmental objectives (Arora, 2010).

1.2. Formulation and Legitimation

India's RE policy formulations are driven by environmental, energy, taxation, and direct RE instruments. At the earlier periods in its history, environmental policy instruments drove India's RE policy formulations. Environmental governance instruments provided that the federal government and other stakeholders should develop and promote RE as supplement and/or alternative to fossil fuel.



India's Ministry of Environment and Forests (MEF), now the Ministry of Environment, Forests, and Climate Change (MEFCC), is responsible for India's environmental policies (MEFCC, 2014). The Ministry released the National Environmental Conservation Strategy and Policy Statement on Environment and Development (NECSPSED) in 1992 (MEF, 1992).

The National Environmental Conservation Strategy and Policy Statement on Environment and Development, 1992, prescribed population control and conservation of natural resources as priorities of the Indian government, with emphasis on concerns about land and water, atmosphere, bio-diversity, and biomass. It recommended developing government policies from environmental perspectives. In order to achieve these recommendations, it provides for support policies and systems that recommend alternative energy (MEFCC, 2014).

The same MEF, as it then was, released the Policy Statement for Abatement of Pollution in 1992 (MEF, 1992B). The document emphasized integrating environmental and economic aspects in development planning. It stressed precautionary methods for pollution abatement, promotion of technological inputs for reducing industrial pollutants, and reliance on public cooperation for securing a clean environment in response to emerging challenges (MEFCC, 2014 B).

The provisions of the two 1992 policy documents reflect the principle that energy concerns should bear environmental awareness and the need for an alternative energy source and technology cleaner than fossil fuel. In addition, the National Action Plan on Climate Change, released in 2008, outlines existing and future policies and programmes on climate mitigation and adaptation measures, and specifically mentions, as a goal, moving from fossil energy to RE (Deiva, 2012).

India's recent RE policy formulations can be found in energy policies, and energy taxation instruments. These include the National Electricity Policy 2005, Rural Electrification Policy 2006, National Tariff Policy



2006, and the Integrated Policy 2006 (Sinha, 2011). India considered the possibility of meeting its electricity target of “Electricity for All by 2012” by RE options under the National Electricity Policy, 2005, and the policy provides that efforts need be made to reduce the capital cost of non-conventional and RE projects (Deiva, 2012; ABPS IAPL, 2009). The Integrated Policy, 2006, provides how to 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 (Sinha, 2011). The Rural Electrification Policy, 2006, provides means by which RE producers could benefit from their supply to the power stream. The National Tariff Policies provide tax concessions for energy production from RE.

The Indian government now pursues three main energy goals: access to energy, energy security, and mitigation of climate change (IEA, 2012). The government regards RE a means for achieving these three goals. For this reason, it has made attempts to legitimate its RE policy, leading to specific RE policy formulations. The MNRE conducted several public workshops and stakeholder consultations in an attempt to develop a comprehensive RE policy (MNRE, 2011). It reviewed its objectives, prepared an action plan, and consulted stakeholders and professionals. Based on the broad guidelines provided by India’s Performance Management Division of the Cabinet Secretariat, the MNRE released the Strategic Plan for New and Renewable Energy Sector (SPNRES) for the Period 2011-2017 (MNRE, 2011).

While previous RE policy formulations were indirect in that they involved using policies in other areas to promote RE, SPNRES presents a direct approach. It shows that RE has become recognized as needing an independent and comprehensive support system. It envisions to “...upscale and mainstream the use of RE sources in furtherance of the national aim of energy security and energy independence, with attendant positive impact on local, national, and global environment” (MNRE, 2011: 16). It is designed to follow four distinct



phases: define the aspiration; assess the situation; develop the strategy; and plan the implementation; and it plans to replace fossil fuel where possible (MNRE, 2011: 16). The MNRE plans to review the plan quarterly, report systems for specific programmes, develop independent monitoring and verification, and initiate other follow up procedures (MNRE, 2011: 62).

1.3. Decision Making and Legislation

While RE is largely regulated at both Federal and State levels, the legal framework under which it operates is primarily federal. The country has no RE-specific regulatory institution and statute.

Being a federal polity, India has a hierarchical regulatory and decision making structure for the RE subsector: Forum of Regulators (FOR), various State Electricity Regulatory Commissions (SERCs), and Central Electricity Regulatory Commission (CERC) (ABPS IAPL, 2009); there is also the Delhi Electricity Regulatory Commission (DERC) (ABPS IAPL, 2009: 34).

The Forum of Regulators (FOR) was constituted under section 166(2) of the Electricity Act (EA), 2003, and consists of Chairperson of Central Electricity Regulatory Commission (CERC) and Chairpersons of State Electricity Regulatory Commissions (SERCs). In giving effects to the provisions of the Electricity Act and other statutes in favour of RE, amidst other provisions, its functions include analysing tariff orders and other orders of the central commission and state commissions, and compiling data arising on them; highlighting, especially, the efficiency improvements of power utilities; harmonizing regulation in the power sector; laying standards of how licensees perform as required under the Act; sharing information among the members of the forum on various issues of common interest and approach; undertaking research work, in-house or through outsourcing, on issues relevant to power sector regulation; evolving measures for protecting interests of consumers, promoting efficiency,



economy, and competition in the power sector; and such other functions as the central government may assign to it, from time to time (Forum of Regulators). The CERC makes decisions and regulates the power industry at the state level, and gives effect to the provisions of the EA, 2003, in favour of RE. The SERCs performs similar functions at the respective state levels, and the DERC performs same at the federal capital level.

Although India does not have a specific law for regulating RE, it is planning to enact one, called the Renewable Energy Act, allegedly based on insights from the German Renewable Energy Act (EA) (Upadhyay, 2014). The country currently regulates RE with some provisions in its EA, 2003 (Upadhyay, 2014).

The Federal Government enacted the EA in 2003. The long title of the EA incorporates, as part of its purposes, promotion of efficient and environmentally-benign electricity policies (Ministry of Law and Justice, 2003). The Act allows easier generation, transmission, and distribution of *centralized non-intermittent* sources of power, including RE (Upadhyay, 2014). It provides that the commission in charge of tariffs should specify the terms for determining electricity tariffs by considering the need to promote the co-generation and generation of electricity from renewable sources of energy (Ministry of Law and Justice, 2003: 31). It states that the Government of India should prepare a National Electricity Policy and Tariff Policy from time to time for developing power systems based on optimal utilization of resources such as coal, natural gas, nuclear substances or materials, hydro and renewable sources of energy (Ministry of Law and Justice, 2003: 8).

In May 2010, the Indian Federal Government adopted the Indian Grid Code (IEGC) 2010. This is the first law that allows integrating RE into the electricity grid system based on States-issued grid codes.



1.4. Implementation

The Federal Government of India implemented RE plans by establishing support institutions and programmes for RE. In 1982, the Indian government established a government department for RE development, reputed to be the first cabinet-level department for promoting RE: It converted the CASE to a government department known as the Department of Non-conventional Energy (Bhattacharya and Jana, 2009; Chaturvedi, 1997; Ottinger, 2005). The Department became the Ministry of Non-Conventional Energy Sources (MNRE) in 1992, and subsequently the federal Ministry of New and Renewable Resources to reflect its RE mandate (MNRE, 2011; Bhattacharya and Jana, 2009). It promotes RE through research and development (Bhattacharya and Jana, 2009; Chaturvedi, 1997).

To boost RE financially, the Federal Government established the Indian Renewable Energy Development Agency (IREDA) in 1987 (Bhattacharya and Jana, 2009). IREDA is a public limited government company under the administrative control of the MNRE, responsible for promoting, developing, and extending financial assistance for RE, and energy efficiency and conservation projects.

India's Federal Government also employs fiscal incentives, tax incentives, purchase targets, and grid integration mechanisms to boost RE (Sinha, A. 2011). To implement the fiscal incentives, it supports RE with budgetary funds; tax incentives come in form of tax concessions and holidays; with purchase targets, it mandates states and other stakeholders to purchase a stated proportion of their energy from renewable sources; and grid integration facilitates features feeding RE into the power grid.

1.5. Assessment

Government institutions, experts, and scholars monitor, evaluate, and communicate the impacts of India's RE policy. IRENA sets the standards for assessing RE to include effectiveness and sustainability, efficiency,



equity, and institutional feasibility (IRENA/UKERC, 2014). Stakeholders consider India's RE policy effective and functional: The Renewable Energy India (TREI) Expo revealed that RE share in India's energy mix increased from 7.8% in 2008, to 12.3% in 2013 (TREI, 2001); Vinjamuri *et al* have shown that an energy mix, with wind energy providing 30%, solar energy 20% and gas turbines (biogas and natural gas) of a further 20%, is working for India (Vinjamuri *et al.*, 2011:162); and Etcheverry finds that RE projects have the prospects to enhance rural sustainability and life (Etcheverry, 2003).

Stakeholders believe India's RE policy promotes social equity. The UN, for example, would conceive India's RE policy to be in support of the 'Sustainable Energy for All Initiative,' aimed at achieving poorest people's access to energy and sustainable use of local resources (Wilson, 2012). It is largely agreed now that RE enhances the chances of rural dwellers having access to power and securing jobs through the availability of power and power production ventures. These are elements pointing to social equity and justice.

However, researchers do not consider India's RE policy efficient. Some argue that RE is still 52-129% more expensive than conventional power, and that RE has set ambitious goals of doubling the existing RE capacity by 2017, but lacks the mechanism to achieve this without increased budgetary allocation (Shrimali *et al.*, 2014). Further investigations on this are left for future research.

3. Conclusion

India's RE policy has all the phases of the policy cycle, save reformulation. These phases are not chronological: They are blurred, and consist of remotely connected stages. Nonetheless, they present a comprehensive policy structure.

The major challenge India's RE policy faces so far is insufficient political and economic support. Commentators have noted that RE competes unfairly with nuclear and fossil energy, and lacks sufficient



tariffs (Meisen, 2010). This is because it is fairly recent, compared to fossil fuel energy. State and non-state actors have huge financial interests in the existing fossil fuel regime, making it difficult for them to prioritize RE over such interests. Perhaps, future reformulation of the policy will take care of this situation.

Acknowledgement

I would like to thank Dr. Andreas Klinke for commenting on the two prior drafts of this paper.

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