

“A Review on Solar Energy Policy Framework in Madhya Pradesh with the special Reference of the Renewable Energy Policy 2022”

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ABSTRACT

This review investigates the solar power policy framework in Madhya Pradesh, with a specific emphasis on the Renewable Energy Policy 2022. Madhya Pradesh, endowed with substantial solar energy potential, has emerged as a key player in India's renewable energy landscape. The state has enacted multiple regulations to foster the adoption of solar energy, with the goal of fulfilling its energy requirements while also honouring its environmental obligations. The Renewable Energy Policy 2022 represents a significant milestone, presenting a comprehensive plan to accelerate solar energy adoption in the state. The regulation emphasizes the establishment of large-scale solar parks, rooftop solar installations, and distributed solar energy systems to achieve a balanced and inclusive growth of the sector. It introduces incentives such as capital subsidies, acquiring land facilitation, and streamlined regulatory procedures to attract investment and boost participation from both public and private sectors. In addition, the policy corresponds with national renewable energy targets, contributing to India's aggregate target of 450 GW of renewable energy capacity by 2030. This overview highlights the key features of the Renewable Energy Policy 2022, assesses its potential impact on the solar energy landscape in Madhya Pradesh, and points out challenges in implementation. It also addresses the policy's role in encouraging innovation, job creation, and sustainable development in the region. By providing a critical examination of the policy framework, this review offers insights into the feasibility of Madhya Pradesh's strategy to harvesting solar energy and its implications for the broader renewable energy goal in India.

KEYWORDS :Renewable Energy; Energy Policy; Solar Energy Policy; Swachh Urja Kosh; Harit Urja Vikas;

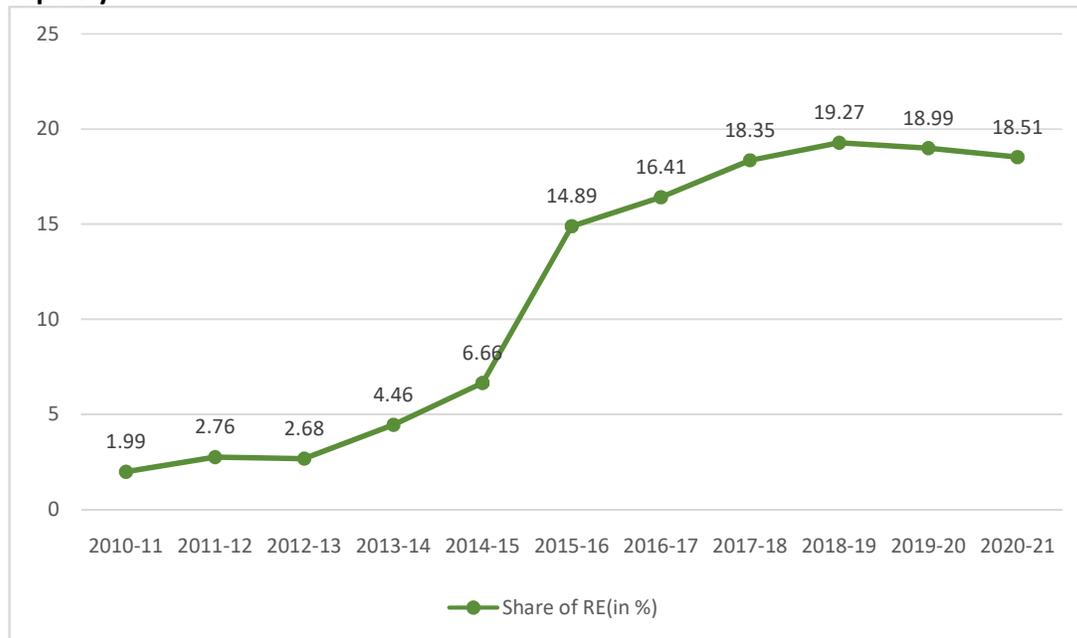
INTRODUCTION

An alternative and cleaner technique of producing power has attracted interest on a global scale over the past few decades owing to many factors such as global warming, energy costs, and the energy crisis. In India, when the Commission for Alternate Sources was established in 1981 under Department of Science and Technology, the policy framework for the renewable energy sector began to take shape. In 1982, independent Department of New Energy Sources, and in 1992, it was given full ministry status (Goel, 2016). This ministry will be responsible for Renewable energy's phenomenon and progress in the country. Now, as of the end of March 2021, renewable energy (not included large hydro) constituted 24.71 percentage of the total installed capacity. In January 2018, the government announced that it has installed 20 GW of solar energy, four years ahead of

schedule. Currently, India's goal is to achieve 175 GW renewable energy capacity (Madhya Pradesh Power Management Company Limited, 2021).

As one of the states with the highest growth in the RE sector, Madhya Pradesh has emerged with around 17% of its 19 GW installed power generation capacity coming from renewable sources, it is already a market leader in this area. According to MNRE's estimation, the state's overall RE potential is 74.33 GW. The State of Madhya Pradesh is showing consistently increase in renewable capacity. As on the end of March 2021, 3,966 MW (18.51%) of total contractual capacity 21,422 MW comes from renewable sources (Madhya Pradesh Power Management Company Limited, 2021). From fig. 1 it is noticed that the trend of share of RE in total energy potential increases.

Fig. 1 Proportion of renewable energy sources in Madhya Pradesh's total installed power capacity

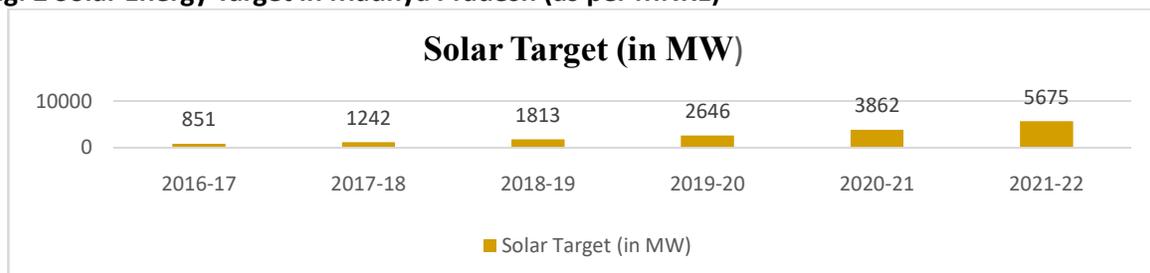


Source: Data taken from (Madhya Pradesh Power Management Company Limited, 2021).

PORTFOLIO OF MADHYA PRADESH’ SOLAR ENERGY SECTOR

One of the leading States in India is Madhya Pradesh, home to 86.40 million people. It has a heavy solar radiation bounty with roughly three hundred days of sunny weather. The state has areas that are ideal for solar project development, with a daily potential of over 5.5 kWh/sq.mt. The state's governments have been actively encouraging the establishment of renewable energy power plants through a range of policy actions and incentive for developers and investors. According to fig. 1 and 2, as share of RE increases, Solar energy generation target decided by MNRE also trending high as demand for alternative sources increases.

Fig. 2 Solar Energy Target in Madhya Pradesh (as per MNRE)



Source: Data taken from (MNRE, 2022) and compiled by author.

The Madhya Pradesh government launched the policy for incentive in 2006 to encourage the use of Alternative energy sources in the state's electricity production. The time frame for this Policy ended in October 2011 but the policy subsumed in Solar Energy Policy, 2010. The next policies came in year 2012, 2016 and 2022.

Madhya Pradesh Solar Energy Policy, 2010 – The primary goals of the SE policy were to expedite the state's solar energy adoption, enhance energy security, promote cost-effective and efficient solar installations through the provision of both financial and non-financial incentives, bolster local manufacturing operations, and harness solar energy through increased public awareness and local capacity building.

Government revenue land will be licensed for a period of thirty years or the duration of the project, whichever is shorter. The annual land premium will be Rs. 1 (token). It is advised that the distribution licensee receive a gross portion of the CDM benefits in accordance with regulatory regulations, or that developers and the licensee split the benefits equally (50:50). Madhya Pradesh government must also promote solar technology parks and manufacturing plants, machinery and related components. The MPUVN will serve as the central organisation for setting up the solar technology parks and manufacture of various solar system systems and components would be supported in the SME sector (Government of Madhya Pradesh , 2010).

Madhya Pradesh's 2012 policy for the execution of projects using solar power - Identify Compensation and advantages to be provided for private sector involvement, create a welcoming environment for the implementation of solar power systems, and create a framework for the application of policy with the goal of promoting private sector involvement in the implementation of solar power-based projects in the Madhya Pradesh. This regulatory structure sort projects into four categories: projects chosen in accordance with the open competition for the sale of electricity to the MP Discoms and MP Power Management Company, Solar Energy projects established under the Jawaharlal Nehru National Solar Mission, Projects established under the technology of Renewable Energy Certificate, and Projects are created for the purpose of using the generated electricity internally, selling it to third parties within or outside the state, or selling it to other states through public access.

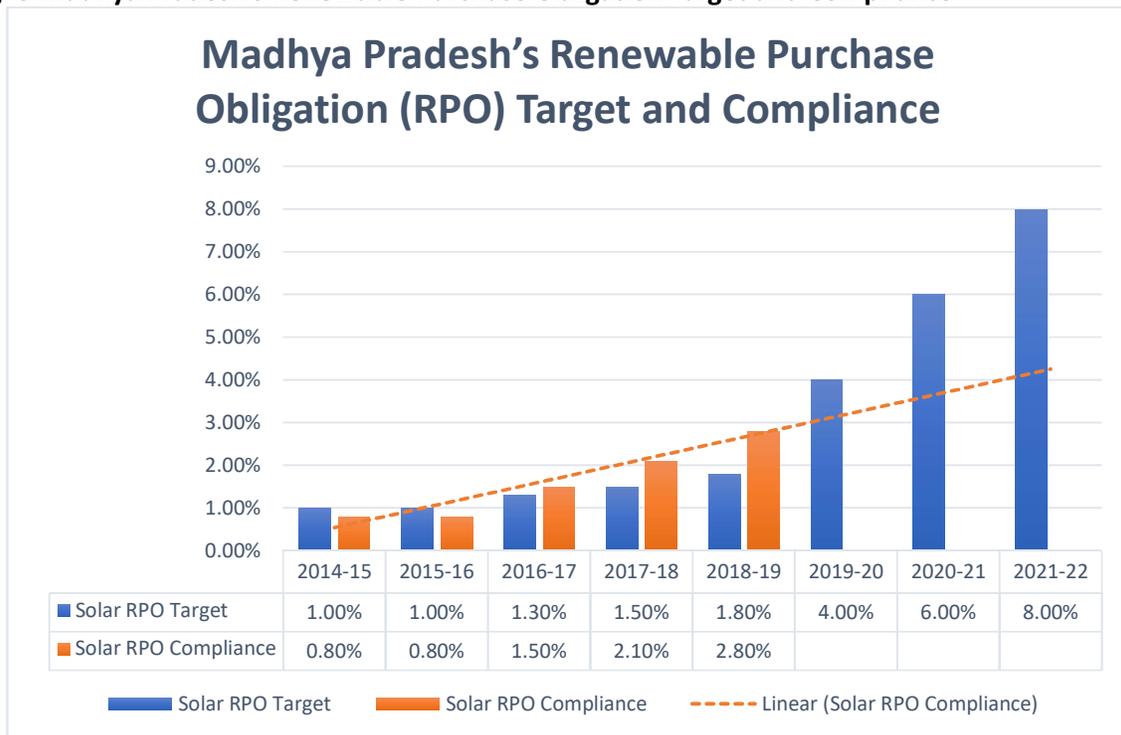
Installation under the Policy shall only be permitted for new equipment. According to the regulation, grant of 4% of the energy will be injected. Exemption from payment for electricity duty and cess will be granted to all solar power plants, including captive units. The policy mandates that the equipment procured for the establishment of solar power stations must be exempted from value-added tax (VAT) and access tax (Madhya Pradesh Urja Vikas Nigam Limited, 2012).

The policy for residential rooftop renewable energy projects in Madhya Pradesh 2016-

The primary goal of the RE policy are to: enhance off grid voltages; decrease carbon emissions; assist the state in fulfilling its Renewable Purchase Obligation; formulate renewable energy opportunities for the future; assist the nation to achieve energy security; generate employment opportunities in Renewable Energy market; and educate the society on the need of conserving electricity and participating in the process of reducing dependence on fossil fuels. This strategy classified grid-connected renewable energy systems into three categories: net measured, wheeled and banked for captive usage and/or third-party auction, and captive install without energy export, or off-grid energy generation systems. The objective of this policy is to encourage the adoption of various types of renewable energy systems installed on rooftops, such

as Net Metered Solar Energy Systems, Off-Grid Renewable energy use Systems, and Renewable Energy Systems used for self-consumption or sold to external parties. These systems will be granted a ten-year exemption from electricity duty and cess starting from the date the policy is implemented. Additionally, there will be no additional property tax obligations for establishing these systems on rooftops or premises. Equipment acquired for the setting up of an energy system that is renewable under this scheme will be exempt from VAT and entry tax. The energy produced by a renewable energy system owned by a net metered consumer is eligible to fulfil the Renewable Purchase Obligation of the distribution licensee. In accordance with laws, Renewable Energy Certificates are issued (Government of Madhya Pradesh, 2016). Form fig. 3 Madhya Pradesh’s Renewable Purchase Obligation target trending sudden increase in within few years and its Compliance seems more than targeted.

Fig. 3 Madhya Pradesh’s Renewable Purchase Obligation Target and Compliance



Source: Data taken from (Verma, 2019) and compiled by author.

The Madhya Pradesh Policy on Renewable Energy, 2022 –

The objective of the policy is to transform the state into a centre for sustainable energy by drawing in investments, making sure that manufacturing plants are outfitted, providing vocational training for labourers to enhance their skills in maintenance and repair, and easing the widespread implementation and utilisation of energy from renewable sources in the state by drawing in investments in the field of producing renewable energy.

The goal is to achieve a 50% share of renewable energy by 2030 while meeting annual renewable energy targets. In addition, the program aims to transition twenty percent, fifty percent, and all of State level government agencies to completely energy from renewable sources by 2024, 2027, and 2030, accordingly, resulting in a carbon footprint of zero. By 2030, the aim is to create Model Renewable Cities and Green Zones adopting the Net Zero Framework. The Agreement will be active for a duration of five years, throughout which it will be fully exempt from the obligation to pay electricity taxes on the generation of electric energy for a period of ten

years. Developers will qualify for a 50% repayment of the stamp duty they have paid on the privately owned property they acquire for the project. Manufacturing facilities producing Renewable Energy equipment that are operational by 31st of March, 2027, or before, will be eligible for the policy's benefits: If the investment sum is less Rs. 50 Crore, general incentives will be available in accordance with the industry/MSME department's applicable regulation. Additionally, if the investment size is greater than Rs. 50 Cr., it will be eligible for incentives under the Promotion Policy of Industrial of manufacturing of RE equipment design. A city or town can be considered a "green city" or "green village" if it consumes at least 30% of its total energy from renewable sources. Government shall nominate local volunteers as "Harit Mitra" at District level and MPPTCL shall nominate "Harit Urja Sahayak" from its staff (New and Renewable Energy Department, Government of Madhya Pradesh, 2022).

KEY CONCEPTS OF RENEWABLE ENERGY POLICY, 2022 FOR PROMOTING SOLAR ENERGY TECHNOLOGY

1. Incentives for RE developers

The following incentives will be offered:

- a) Electricity Duty and Energy Development Cess Exemption
- c) Reimbursement of 50% of the Stamp Duty
- c) Government Land at a discounted price
- d) The exclusion of wheeling fee
- e) Carbon credits or other comparable rewards

However, in regard to selling RE electricity in or outside of Madhya Pradesh:

- a) Rs. 0.10 per unit in "Harit Urja Vikas" Fees shall be charged.
- b) "Harit Urja Vikas" Fees of Rs.0.10/unit shall be charged in the event of captive use.
- c) public land cannot be sold to or used for captive purposes by third parties.

2. Incentive for Renewable Energy Equipment Manufacturers

Manufacturers, including start-ups, MNC, component designers, and firm of system developers, will be eligible to access incentives, with the goal of advancing the mechanism of design and development of Renewable Energy projects. a) RE equipment manufacturing should be categorised as "Industry". b) Manufacturing facilities that install RE equipment into service by March 31, 2027, or before, will be eligible for the following benefits: general incentives based on investment amount; if an investment is equal to or less than Rs. 50 Cr., you are eligible for further incentives.

3. Improved incentives for a project that stores energy from renewable sources

There will be an extra incentive available for renewable energy-based projects that use any of the energy storage technologies that are currently on the market. The following incentives will be available: a) There are no registration or facilitation expenses
b) Stamp duty is reimbursed and electricity duty is exempted
c) Government land available at a reduced cost

4. Initiatives for Green Transformation

The government shall pursue the following actions in an effort to raise the green energy footprint in the total energy production:

- a) The green Cities/Villages (with a minimum of 30% renewable energy in the total energy mix)
- b) The focus is on all public buildings, such as schools, publicly traded distribution offices, Aanganwadi kendras, healthcare facilities, street lighting, public water transporting points, local and large organisational setups, battery-powered buses, e-rickshaws, and e-autos.
- c) The intended penetration of renewable energy (30% of the energy mix) would be attained.

- d) Subsidy provided by a State or Central Government Program.
- e) The goal of greening a city or hamlet would be accomplished in stages:
 - Stage I: Green Substation, Green Vending, and Green Streets.
 - Stage II: Green Dwellings, Green Residence, Green Institutions, and Green Mobility.
 - Stage III: Akshay Grams, community-based biogas production, and community-based renewable farming.
- f) Green Zones—akin to Special Economic Zones (SEZ)—are places where businesses registered under global programs like the Climate 20 initiative, the RE-100 Commitment, and Net-Zero Emissions are encouraged to establish offices in order to promote RE and reduce greenhouse gas emissions. There exist other noteworthy corporations as well, having a minimum annual turnover of \$50 Cr and the qualified and interested entities are asked to express their interest through MPUVNL.
- g) Entities establishing offices in green zones will receive the following benefits.
 - i. Waivers of all electricity taxes for ten years at 100%
 - ii. 50 percent of the stamp duty paid while buying private land is refunded
 - iii. Government land is available at a discounted price (a 50% DLC rate rebate).
 - iv. Government offices will be converted to "Harit Karyalayas" with net zero carbon emissions from electricity use.
 - v. The government shall give premier technical institutions, research institutes, and commercial enterprises with 100% financial support.

5. Initiatives for Skill Development and R&D

The following initiatives will be taken:

- a) The government will establish courses in ITIs and skill development centres.
- b) The government must also see to it that the state has at least five ITIs and five diploma colleges.
- c) The government may collaborate with top technological and scientific institutions, whether they are public or private.

6. Public Awareness

The following initiatives will be taken:

- a) At the district level, the government shall designate and manage the "Harit Mitra" database of local volunteers.
- b) organise a village-level campaign to promote the advantages of implementing different RE plans.
- c) Provide pertinent details regarding residential rooftop, solar pumps, and related advantages.
- d) Enhance the use of online social platform to spread the word about policies and advantages, and organise regular workshops or virtual conferences (either annually or biannually) to increase visibility.
- e) The government will honour "Harit Mitra" for outstanding performance.
- f) Adequate financial rewards for "Harit Mitra".

7. Madhya Pradesh's "Swachh Urja Kosh"

There is a Madhya Pradesh's Swachh Urja Kosh for Renewable Energy Projects where fees for the Harit Urja Vikas must be submitted. The contribution must be charged on or after the start date of this policy and remain in the designated account that the government may have authorised for the duration of the project's life cycle (New and Renewable Energy Department, Government of Madhya Pradesh, 2022).

BARRIERS IN IMPLEMENTATION OF SOLAR AND RENEWABLE ENERGY POLICY

Substantial obstacles confront the renewable energy sector. Certain issues are caused by a market and government context that is deformed, while other problems are fundamental in all environmentally friendly energy technology. The adoption of renewable technologies is hindered by a limited understanding of comprehensive legislative and regulatory frameworks. The private sector project approvals are being delayed as a result of insufficiently defined policies. The following elements illustrate the obstacles to implementing policy:

1. The existing connectivity laws do not acknowledge the provision of low voltage rooftop connectivity.
2. The economy lacks specific potential for increasing income, improving the trade balance, promoting industrial development, and generating employment.
3. Market failures, a lack of knowledge found in society about Solar Technologies.
4. The commercialisation of renewable resources is hindered by a scarcity of raw materials.
5. Crucially, the inefficient way we (humans) use energy are difficulties.
6. Inadequate production capacity, a lack of trained labour, weak transmission and distribution infrastructure, and transmission losses.
7. For any business policy stability and continuity are vital but there are specific short or medium term policies for and renewable energy systems.
8. The main problem with renewable energy sources is that power is sporadic, necessitating large-scale power storage plans through batteries or other mechanisms.
9. There is no effective grid management and the monitoring of energy producers for compliance with grid codes.
10. Markets in developing nations like India are more sensitive to policy costs (Timilsinaa, Kurdgelashvilib, & Narbel, 2012).

CONCLUSION AND SUGGESTIONS

This study examined the specific State policies aimed at promoting Solar energy. This study examined the potential and expansion of the Solar energy industry, as well as the current regulations in Madhya Pradesh that aim to encourage its incorporation into the energy mix. Additionally, the study identified the major obstacles that impede the development of energy from renewable sources in the State. Some particular recommendations for effectively implementing policies and increasing awareness of renewable energy include:

1. It can be strengthened by amending the building bylaws to provide rooftop solar.
2. Solar energy can be utilised in distributed generation and local distribution networks to balance out the transmission and distribution costs and energy losses sustained by states, despite the fact that its initial installation costs are relatively higher than those of traditional fuels.
3. Solar energy strategy integration into development programmes will support its decentralised applications.
4. For the rapid commercialization of solar energy as well as the development of market infrastructure, government regulations should encourage increased private engagement and industry collaboration in R&D.
5. It is necessary to redefine the public-private relationship in solar energy development in the perspective of providing energy services (Upadhyay & Chowdhury, 2014).
6. Government may provide economic incentives for suppliers could include credit guarantees, soft credit, and duty exemptions; incentives for buyers could include tax relief,

- subsidies, and advice services (International renewable energy agency and Clean Energy Ministerial, 2014).
7. The mitigation of climate change can be greatly aided by reducing carbon footprint through changing lifestyle and behaviour.
 8. In order to reduce the effects of climate change, there should be greater international collaboration and support to expand green infrastructure for contemporary supply and sustainable energy services (Owusu & Asumadu-Sarkodie, 2016).

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