VIKSIT BHARAT @ 2047 : CLIMATE CHANGE POLICIES AND RENEWABLE ENERGY REGULATIONS

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ABSTRACT

Viksit Bharat 2047 endeavours to make India greener and cleaner. The government has started programmes to encourage renewable energy use, water conservation, and cleanliness, including the Swachh Bharat Abhiyan, Jal Jeevan Mission and National Solar Mission. It supports conservatory initiatives, climate-resilient infrastructure, and renewable energy. India is dedicated to upholding internationally acknowledged environmental standards. It aims to achieve approximately fifty per cent of its installed electric power capacity from non-fossil fuel sources by 2030. In its commitment to meet 'Net Zero' by 2070, the government has adopted strategies, such as viability gap funding for wind energy, setting up of coal gasification and liquefaction capacity, phased mandatory blending of CNG, PNG and compressed biogas, and financial assistance for procurement of biomass aggregation machinery. Rooftop solar installation will enable one crore households getting access to solar energy; obtaining up to 300 units of free electricity per month. Adopting e-buses for public transport network and strengthening the overall e-vehicle ecosystem, etc. are some of the key aspects associated with harnessing solar energy.

By 2030, India envisions producing 5 million tons of renewable hydrogen. Fifty solar farms with a combined capacity of 37.49 GW have been approved in India. India has made progress towards achieving the Sustainable Development Goals for environmental protection by funding a number of projects in line with its NDC, including the Swachh Bharat Mission, National Smart Grid Mission, and Atal Mission for Rejuvenation and Urban Transformation (AMRUT). India has placed a high priority on energy-efficiency improvements, resilient urban infrastructure—both green and blue—and clean and efficient energy systems (OSOWOG and floating solar panels), even to endure climate-related disasters. One Sun, One World, One Grid: India highlighted the phrase "One Sun, One World, One Grid" (OSOWOG) to unite the world to gather solar power around the clock, and at the United Nations Climate Change Conference in Glasgow (COP 26) in 2021, the country committed to becoming net zero emitters of carbon by 2070 (MNRE, 2020).

India's agriculture and food security are at risk due to rising temperatures and lower rainfall. Climate-related impacts on water resources can badly affect hydropower and thermal power generation, leading to water stress and increased water scarcity. Climate change is expected to pose major health impacts in India, especially on vulnerable communities, leading to an increase in malnutrition and other health disorders. India has declared her goal to achieve net zero emissions by 2070, with a target to transition to a net zero economy, balancing GHG emissions with their removal in a green and sustainable way for a better and more prosperous future.

Key words: Climate-resilient infrastructure, Net zero emissions, Green and sustainable economy,Sustainable Development Goals (SDGs)

Need for the Study

The need for this study arises from the increasing global concern about climate change and environmental degradation and the urgent requirement to transition toward sustainable and renewable energy sources. Climate change is causing severe environmental problems such as rising temperatures, irregular rainfall, floods, droughts, and water scarcity, which directly affect economic development, agriculture, energy security, and human health.

India, as a rapidly developing country, faces the challenge of balancing economic growth with environmental sustainability. Therefore, it is essential to examine the country's climate change policies and renewable energy regulations that aim to reduce greenhouse gas emissions and promote clean energy.

This study is needed to understand the government initiatives, regulatory frameworks, and policy targets introduced under the vision of Viksit Bharat @ 2047, which focuses on building a greener and more sustainable economy. It also highlights India's commitments such as increasing non-fossil fuel energy capacity, reducing emission intensity, and achieving net-zero emissions by 2070.

Furthermore, the study helps in analyzing the role of major schemes and programs promoting renewable energy adoption, energy efficiency, and climate-resilient infrastructure. By examining these policies and initiatives, the research contributes to understanding how India can achieve sustainable development while addressing climate challenges.

Recent Methodology

Based on the document, the methodology is mainly a policy analysis and scheme-based implementation approach. It studies and explains government strategies, targets, and regulatory mechanisms used to achieve climate goals.

Policy and Target-Driven Approach

The study analyzes India's climate policies guided by Nationally Determined Contributions (NDCs) under the Paris Agreement.

Key targets examined include:

- 500 GW non-fossil fuel energy capacity by 2030
- 45% reduction in emissions intensity by 2030
- Net-Zero emissions by 2070

2. Regulatory and Market Mechanism Analysis

The methodology evaluates regulatory frameworks such as:

- Energy Conservation (Amendment) Act, 2022

- Carbon Credit Trading Scheme (CCTS) to create an Indian carbon market and reduce greenhouse gas emissions.

3. Scheme-Based Implementation Review

The research reviews major government renewable energy schemes, including:

- Production Linked Incentive (PLI) for solar manufacturing
- Approved List of Models and Manufacturers (ALMM) regulation
- PM-KUSUM Scheme for solar pumps for farmers
- PM Surya Ghar: Muft Bijli Yojana for rooftop solar energy.

4. Data and Policy Evaluation

The paper uses recent statistics on renewable energy capacity, solar farms, hydrogen production targets, and installed renewable power to evaluate progress toward climate goals.

Introduction

India's vision of becoming a developed nation by 2047—dubbed **Viksit Bharat@2047**—is inextricably linked to its climate change policies and the rapid expansion of renewable energy. This ambitious goal recognizes that sustainable, green growth is the only path to a prosperous future, balancing economic development with environmental preservation. The country is moving away from the "use-and-dispose" model and embracing a mindful, circular economy. At the heart of this transition are a set of bold targets, strategic regulations, and key government schemes designed to decarbonize the economy and build climate resilience.

CLIMATE CHANGE

Severe heat events, sea level increase, widespread flooding, changing rainfall patterns, severe droughts, ground water, glacier melt, and health are affected due to climate change. Water is essential for the delivery of energy, and vice versa. In the coming years, the inter-dependency between energy and water will grow, with important implications for the security of both. Water around the world is impacted by climate change in several intricate ways. Climate change affects rainfall and tampers with the hydrological cycle, resulting in erratic patterns of precipitation, glacier melting, sea level rise, floods, and droughts (UN Water). Due to the disruption of precipitation patterns and the water cycle caused by rising temperatures, climate change is having a significant impact on the availability of water and causing water-related risks such as floods and droughts (UNICEF).

2.1 Organisation and policies:

To prevent and stabilize the GHG concentrations in the atmosphere, it was decided to adopt the United Nations Framework Convention on Climate Change (UNFCCC). Over the past 20 years, GHG emission concentrations have reached historic highs and are still far from levelling down.

India had a strong desire to cooperate internationally under the United Nations Framework Convention on Climate Change (UNFCCC). In general, future global climate change collaborations will focus on the

following goals: 1. Implementation of appropriate adaptation and mitigation strategies to reduce the adverse effects of climate change. 2. Make sure that all activities and measures are equitable and fair. 3. Make sure that technology is accessible on reasonable terms. 4. Creation of a worldwide framework for climate change action, based on the Paris Agreement.

The Energy Conservation (Amendment) Act (2022) is pivotal, introducing concepts like the **Carbon Credit Trading Scheme (CCTS)**. This market-based mechanism is designed to incentivize energy efficiency and the reduction of greenhouse gas (GHG) emissions across various sectors, creating an Indian Carbon Market.

2.2. Policy and Target Landscape

India's climate action is primarily guided by its **Nationally Determined Contributions (NDCs)** under the Paris Agreement. Updated in 2022, these commitments serve as the foundation for the Viksit Bharat 2047 vision. The key climate and energy targets include:

Renewable Energy Capacity: Achieving **500 GW of non-fossil fuel-based energy capacity by 2030**. India has already made significant progress and, as of June 2025, has surpassed its initial NDC goal of 50% of installed electric power capacity from non-fossil fuels, five years ahead of schedule.[1]

Emissions Intensity Reduction: Reducing the **emissions intensity of its GDP by 45% by 2030** from 2005 levels.

Carbon Sink Creation: Creating an additional **carbon sink of 2.5 to 3 billion tonnes of CO2** equivalent through increased forest and tree cover by 2030.

Net-Zero Target: Achieving **Net-Zero emissions by 2070**.

These goals are supported by the **National Action Plan on Climate Change (NAPCC)**, a national strategy with nine submissions that guide policy across various sectors, from solar energy to sustainable habitats and water management.[2]

2.3. Renewable Energy Regulations and Schemes

India's renewable energy growth is propelled by a combination of regulatory frameworks and targeted financial incentives. The government is actively creating a supportive ecosystem for clean energy adoption.

Production-Linked Incentive (PLI) Schemes: These schemes incentivize domestic manufacturing of key renewable energy components, such as high-efficiency solar photovoltaic (PV) modules. The

[1]Press Information Bureau. (2025, June). *India achieves major milestone in energy transition, surpasses NDC goal*
[2] Ministry of Environment, Forest and Climate Change. (2008). *National Action Plan on Climate Change (NAPCC)*. Government of India. https://moef.gov.in/

goal is to build a robust local supply chain, reduce reliance on imports, and position India as a global manufacturing hub for clean energy technologies.[3]

Approved List of Models and Manufacturers (ALMM): The ALMM regulation acts as a non-tariff barrier, mandating that government-supported projects use solar cells and modules from an approved list of domestic manufacturers. This policy further strengthens the "Make in India" initiative and ensures quality standards.

PM-KUSUM Scheme: The **Pradhan Mantri Kisan Urja Suraksha Evam Utthaan Mahabhiyaan** scheme empowers farmers by providing subsidies for installing solar pumps and setting up small solar power plants on their land. This initiative reduces their dependence on diesel, lowers irrigation costs, and allows them to generate additional income by selling surplus electricity to the grid.[4]

PM Surya Ghar: Muft Bijli Yojana: This recent initiative aims to provide up to **300 units of free electricity per month** to one crore households by subsidizing the installation of rooftop solar panels.[5]The scheme not only promotes decentralized solar power but also directly benefits citizens by significantly reducing their electricity bills.

Solar Parks Scheme: To facilitate the development of large-scale solar projects, the government is establishing "Solar Parks and Ultra Mega Solar Power Projects," providing the necessary infrastructure for developers to set up utility-scale solar plants.

3. Challenges and the Path Ahead

India's reliance on coal, a major source of emissions, needs a systematic phase-down as renewable energy scales up. While the share of coal capacity has dropped, it still accounts for a significant portion of the energy mix. Additionally, strengthening the electricity grid and developing large-scale energy storage solutions are crucial to manage the intermittent nature of solar and wind power.

The Viksit Bharat 2047 vision is not just a growth plan. it's a statement of India's commitment to global climate action while addressing its own developmental needs. By prioritizing sustainable policies and leveraging

[3] Ministry of New and Renewable Energy. (2022). *Production Linked Incentive Scheme for high efficiency solar PV modules*. Government of India. https://mnre.gov.in/

[4] Ministry of New and Renewable Energy. (2020). *Pradhan Mantri Kisan Urja Suraksha Evam Utthaan Mahabhiyaan (PM-KUSUM) Scheme*. Government of India. https://mnre.gov.in/

[5] Press Information Bureau. (2024, February). *PM Surya Ghar: Muft Bijli Yojana launched to light up homes* [Press release]. https://pib.gov.in/

renewable energy, India aims to prove that economic prosperity and environmental stewardship can, and must, go hand in hand.

4. Key Climate Policies and Goals

India's climate action is guided by its **Nationally Determined Contributions (NDCs)** under the Paris Agreement. Key targets include:

Net-Zero by 2070: A long-term commitment to a carbon-neutral future.

Emissions Intensity Reduction: A significant goal to reduce the emissions intensity of India's GDP by 45% by 2030 from 2005 levels.

Non-Fossil Fuel Capacity: A target of reaching **500 GW of non-fossil fuel-based energy capacity by 2030**. This is a monumental shift from fossil fuels to clean energy sources.

These goals are supported by regulations that encourage domestic manufacturing, such as the **Production-Linked Incentive (PLI) scheme** for solar PV modules, and schemes like the **Green Credit Program** and **Green Hydrogen Mission**.

Renewable Energy Resources and Schemes

India is focusing on its vast renewable energy potential, primarily solar and wind. To achieve its targets, the government has launched several key initiatives:

Solar Power: Initiatives like **PM Surya Ghar: Muft Bijli Yojana** promote rooftop solar installations for households, providing free electricity and reducing grid dependency. The **PM-KUSUM scheme** empowers farmers by subsidizing solar pumps, cutting their reliance on diesel. The country is also a leader in utility-scale solar projects, having surpassed its initial NDC goal of 50% non-fossil fuel capacity well ahead of schedule.

Wind and Hydropower: India is expanding its wind energy capacity, especially in coastal and high-altitude regions. Hydropower and other non-fossil sources are also being developed to create a diverse and resilient energy mix.

Energy Storage: To address the intermittent nature of renewable energy, there is a strong emphasis on developing and deploying **Battery Energy Storage Systems (BESS)** and pumped storage power projects to ensure a stable and reliable grid.

By 2030, India envisions producing 5 million tons of renewable hydrogen. This will be made possible by 125 GW of renewable energy capacity. Fifty solar farms with a combined capacity of 37.49 GW have been approved in India. Likewise, India is targeting to produce 30 GW of offshore wind energy, and possible locations have been found for this. More than 150 GW of renewable energy sources have been established, and as of May 2024, the total installed capacity of renewable energy sources, including major hydropower, is 193.57 GW. The installed capacity for renewables is as follows:

1. Solar power: 84.27 GW;
2. Large hydro: 46.92 GW;
3. Wind power: 46.42 GW;
4. Biomass and co-generation: 10.35 GW;
5. Small hydro power: 5 GW;
6. Waste to energy: 0.59 GW.

5. Conclusion:

Climate change policies should be given utmost importance in sustainable development. A sustainable development path can reduce GHG emissions and reduce

vulnerability to climate change. Hence, global mitigation efforts can facilitate sustainable development prospects in part by reducing the risk of adverse impacts on climate change.

Mitigation can also provide co-benefits, such as improved health outcomes. Mainstreaming climate change mitigation is a key integral part of sustainable development. Socioeconomic development is given priority while considering climate actions.

The SDG 7 is to ensure access to affordable, reliable, sustainable, and modern energy for all around the globe. Priority is given to securing energy access because it is interconnected with various other socio-economic aspects such as poverty alleviation, health, industrialisation, education, provision of communication infrastructure, and overall development of any nation.

India has declared her goal to achieve net zero emissions by 2070, with a target to transition to a net zero economy, balancing GHG emissions with their removal in a green and sustainable way for a better and more prosperous future.