

Non Traditional Security Digest

India's Renewable Energy Pathways 2030

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मनोहर पर्रिकर रक्षा अध्ययन एवं विश्लेषण संस्थान

India's Renewable Energy

Pathways 2030

As per the [Intergovernmental Panel on Climate Change's](#) (IPCC) sixth assessment report, the world is set to reach the 1.5°C level within the next two decades. It specifies that in order to prevent global environmental disasters the world needs to take adequate action to limit global carbon emissions. India, for the past many decades has been consistently working to fulfill its global climate obligations and has also made significant progress in this direction even before its set timelines.

This edition of the NTS digest highlights India's key climate commitments made under the leadership of Prime Minister Narendra Modi. Subsequently, the second part of the digest focuses on India's key actions taken in multiple renewable energy sectors to meet its climate goals.

Key Speeches

Prime Minister Modi's vision has played a critical role in stimulating discussions on India's renewable energy sources. Some of his important speeches are highlighted below.

COP 21 Paris 2015

Speaking at [COP 21 in Paris](#) in 2015, PM Narendra Modi mentioned that by 2030, India will reduce its carbon emissions by 33 to 35% percent of 2005 levels and 40 per cent of the country's installed capacity will be from non-fossil fuels. He highlighted that India would achieve these targets by expanding its renewable energy bases. PM Modi further called for enlarging India's existing forest cover to absorb at least 2.5 billion tonnes worth of carbon dioxide.

During his address, PM Modi called upon the advanced nations to take their climate targets seriously. In his speech, he further reminded the developed states regarding mitigation action including ratification of the 2nd Commitment period of the [Kyoto Protocol](#).

PM Modi asserted that the principles of equity and common but differentiated responsibilities must remain the bedrock of states' collective enterprise across all areas of mitigation, adaptation and means for implementation. He further mentioned that developed countries must fulfill their responsibility to make clean energy available, affordable and accessible to all in the developing world for the planet's collective interest.

He finally emphasized that the developed countries should mobilize 100 billion US Dollars annually by 2020 for mitigation and adaptation in the developing countries. He reiterated that the states need to fulfil their commitments in a credible, transparent and meaningful manner.

UN General Assembly 2015

Speaking at the [UN General Assembly in 2015](#), [PM Modi](#) gave a detailed account of India's approach to climate issues. He asserted that India welcomes the prominence given to environmental goals, especially climate change and sustainable consumption. He mentioned that India's distinct goal on the ocean ecosystem reflects the unique character of its challenges and opportunities.

He also talked about the 'Blue Revolution', which includes prosperity, sustainable use of marine wealth and blue skies. He also highlighted that India's development agenda is mirrored in the Sustainable Development Goals. PM Modi further emphasized that India represents a culture that calls our planet 'Mother Earth'

In his speech, the Indian prime minister called for installing 175 GW of renewable energy over the next seven years. He further

reiterated that India in the coming years seeks to become energy efficient by reforming its transportation system, by cleaning up cities and rivers and by undertaking an afforestation programme. He highlighted that international partnership must be at the centre of states' efforts in combating climate change for which the principle of common but differentiated responsibilities should be adhered to strictly. He also emphasized to forge global public partnerships to harness technology, innovation and finance to put affordable clean and renewable energy within the reach of all states.

He also called for making lifestyle changes to make people less dependent on energy and more sustainable in their consumption. Finally, he called for launching a global education programme that could prepare the next generation to protect and conserve nature.

COP 26 Glasgow 2021

PM Modi in his [speech at COP26](#) highlighted India's commitment to address the issue of climate change. He mentioned that India ranks 4th in the world in installed renewable energy capacity. He highlighted that India's non-fossil fuel energy has increased by more than 25% in the last 7 years and has now

reached 40% of its total energy mix. Commenting on India's vast railway network, he mentioned that Indian Railways has set a tremendous target 'Net Zero' emission by 2030. This would subsequently reduce net emissions by 60 million tonnes annually. He also presented India's massive LED bulb campaign that is playing a significant role in reducing emissions by 40 million tonnes annually.

PM also talked about India's revolutionary advances towards solar power and stressed on country's push for International Solar Alliance. The Prime Minister outlined India's approach through 'Panchamrit' (five elements). First, India would take its non-fossil energy capacity to 500 GW by 2030. Second, India will meet 50 per cent of its energy requirements from renewable energy by 2030. Third, India will reduce the total projected carbon emissions by one billion tonnes from now till 2030. Fourth, by 2030, India will reduce the carbon intensity of its economy by more than 45 per cent. And fifth, by the year 2070, India will achieve the target of Net-Zero.

He concluded by raising issues of climate finance and low-cost climate technologies, the prime minister urged the developed countries to fulfil these obligations at the earliest.

World Sustainable Development Summit 2022

Prime Minister Narendra Modi delivered the inaugural address at [TERI's World Sustainable Development Summit, 2022](#). In his speech, he recalled that Environment and sustainable development have been areas of key focus for him since his 20 years in office. He said that it is not the planet that is fragile but the commitments to the planet and nature that have been fragile. In his speech, he highlighted that very little has been done globally since the 1972 Stockholm Conference. He mentioned that equitable energy access to the poor has remained a cornerstone of India's environmental policy.

In his speech, PM Modi highlighted India's [Ujjwala Yojana](#) which has enabled 90 million Indian households with easy access to clean cooking fuel. PM Modi mentioned that under [PM-KUSUM scheme](#), Indian farmers have been encouraged to set up solar panels and use clean energy and even sell the surplus power to the grid. Prime Minister further in his speech informed about India's LED bulbs distribution scheme. He mentioned that this has helped saved more than 220 billion units of electricity and 180 billion tonnes of carbon dioxide emissions per year.

Commenting on the [National Hydrogen Mission](#) that aims at tapping Green Hydrogen, PM Modi encouraged academic and research institutes like TERI to come up with scalable solutions to realize these potentials. PM Modi also mentioned that restoring degraded land has been India's focus area and since 2015 and more than 11.5 million Hectares have been restored. The Prime Minister stressed that environmental sustainability can only be achieved through climate justice. He said that the energy requirements of the people of India are expected to nearly double in the next twenty years. He emphasized that the developed countries therefore need to fulfil their commitments to finance and technology transfer.

Commenting on India's "[One Sun, One World, One Grid](#)" initiative he reiterated India's call toward working and ensuring the availability of clean energy from a worldwide grid everywhere at all times. Finally, PM Modi highlighted two important initiatives of LIFE - Lifestyle For Environment and the 3 Ps- Pro Planet People. He concluded by saying that global coalitions will form important foundations for environmental efforts aimed at improving the global commons.

G7 Summit Germany, 2022 (Investing in a better Future: Climate, Energy, Health)

Speaking at 'Investing in a better Future: Climate, Energy, Health', [G7 Summit](#) PM Modi began his speech by asserting that though 17% of the world's population resides in India, India's contribution to global carbon emissions is only 5%. He highlighted that the main cause is people's efficient lifestyle, which is based on the theory of co-existence with nature. PM Modi in his speech mentioned that access to energy should not only be the privilege of the rich, but the poor should also have the equal right over this.

He further highlighted that India already achieved its target of 40 per cent energy-capacity from non-fossil sources 9 years before the scheduled time. Further, the target of 10 percent of ethanol-blending in petrol has also been achieved 5 months before time. He also highlighted that India has the world's first fully solar power-operated airport and mentioned that India's railway system will become net zero in this decade. PM Modi emphasized that the countries of G-7 should further support India's efforts. He mentioned that a huge market for clean energy technologies is emerging in India and G-7 countries can invest in research, innovation, and manufacturing in this field. The scale that

India can provide for every new technology can make that technology affordable for the whole world. In his concluding remarks, PM Modi emphasized that human and planet health are interconnected so India has adopted the approach of one world, one health. During the pandemic, India found many creative ways to use digital technology in the health sector. He stressed that G7 countries can help India to take these innovations to other developing countries.

Finally, mentioning about the emerging importance of traditional medicine in many countries, he complimented WHO's decision to set up a Global Centre for Traditional Medicine in India. PM Modi asserted that this centre will not only become a repository of different traditional medicine systems all over the world but will also encourage more research in this area that will benefit global mankind.

India's Renewable Energy Advances

India's advances in the renewable energy domain corresponds with the resolve in speeches of the top leadership. The government has set goals to reach 500 GW of total renewable energy capacity by 2030 and nearly 175 GW by the end of 2022. Following is the status of India's initiatives in multiple renewable energy sectors.

Solar Energy

India's solar power engagements have rapidly increased in the last few years. Solar energy has also been the central focus of several government initiatives. The key example of which is India's National Action Plan on Climate Change with the National Solar Mission as one of the major Missions. According to the [Ministry](#) of New and Renewable Energy, the government targets installing 100 GW grid-connected solar power plants by the end of this year. From less than 10 GW in 2010, the government [surpassed](#) a record 50 GW capacity in 2022. It added [7.2](#) GW to the installed solar capacity this year.

According to the Renewables 2022 Global Status [Report](#) published by Renewable Energy Policy Network for the 21st Century (REN 21), India ranks 3rd in renewable energy installations and 4th in the global Solar PV capacity. India's largest floating solar power project in Telangana became fully operational in July 2022 and the government has now announced the construction of the world's largest [floating](#) solar plant in Madhya Pradesh. The plant will have a generational capacity of 600 MW.

India's solar bids have also received recognition through foreign investments. The

Norwegian Climate Investment Fund has committed to a 49% stake in a 420 MW solar power plant in Rajasthan named Thar Surya 1. The climate fund will allocate approximately 1 billion USD, with India as a primary beneficiary. India recently expanded the purview of solar diplomacy by inviting Central Asian states to join the International Solar Alliance and the One Sun, One World, One Grid initiative.

Coupled with the state focus on sustainable growth and solar energy potential, current predictions depict a decreasing dependency on coal as a source of energy (Fig 1). This is further intensified by the cost-competitiveness and interlinking of solar energy with other technologies. However, the impact of COVID and climate-related issues also has to be accounted for, in a bid to meet the 2022 hundred GW target.

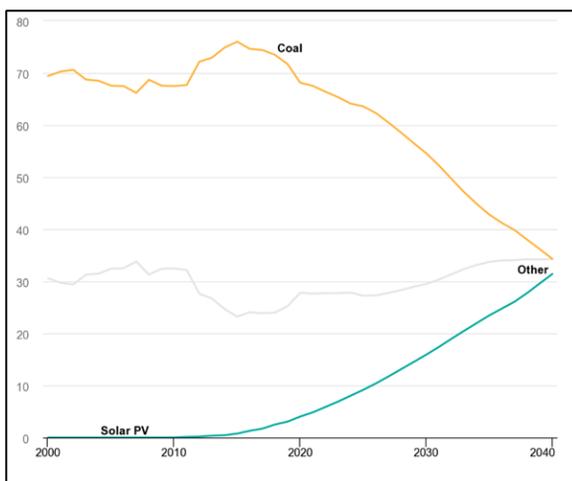


Figure 1

Wind Energy

The wind energy sector has witnessed a steady increase in capacity over the past few years. According to the Ministry of New and Renewable Energy, the country currently has the fourth highest wind installed capacity in the world and has generated around 60.149 billion units during 2020-21. Seven windy states of Gujarat, Rajasthan, Maharashtra, Tamil Nadu, Madhya Pradesh, Karnataka and Andhra Pradesh carry the maximum wind energy potential. At a target of 60 GW, the government has currently an installed capacity of 39.2 GW (as of March 2022). In the second quarter of 2022, India further added 430.45 MW capacity. Increasing the year-over-year installations by 80% in comparison to 2021 (figure 2).

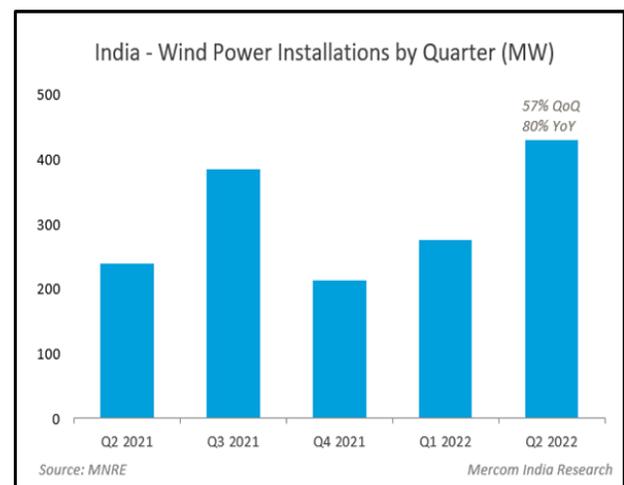


Figure 2

Wind energy projects are also facing climate change disruptions which have slowed down India's progress in the sector. In a [study](#) by the Indian Institute of Tropical Meteorology, it is estimated that the seasonal and annual wind speed is likely to decrease over North India. Thereby reducing the efficiency of production.

Harnessing Offshore wind energy is a major component of the policy planning of the state. The ministry has set a target of 5.0 GW of [offshore](#) wind installations by 2022 and 30 GW by 2030. The government recently invited global companies to set up remote sensing [sensors](#) upon floating buoys in the Gulf of Mannar at three locations. These will support the assessment and estimation of wind energy potential. Additionally, private sector investments play a major role in capacity building and installations. The government recently released [bids](#) of 12 GW for offshore installations in Gujarat and Tamil Nadu.

Hydro Energy

The government has taken several [measures](#) to boost the [hydro power sector](#). Declaring Large Hydropower Projects (HPO) as a component of the Non-Solar Renewable

Purchase Obligation (RPO) is one of them. In order to realise the 21135.37 MW [potential](#) from 7135 sites, the government has also started [Small Hydro Power Programme](#) which aims to encourage State Government entities and Independent Private Producers (IPPs) to establish new Small Hydro projects. The plan also includes funding for the construction of watermills for mechanical and electrical purposes in remote and distant locations. From an overall [target](#) of 5 GW in small hydro projects, the government already has an installed capacity of 4.8 GW. In a recent development, India agreed to partner with [Nepal](#) to develop two hydropower projects. Named as West Seti Hydropower Project and the Seti River Hydropower Project, the estimated cost of construction is expected to be \$2.4 billion. Notably, the agreement was signed after the withdrawal of two Chinese companies from the project. Recently the National Hydro Electric Power Corporation (NHPC) also inked a pact with the Himachal Pradesh government to implement the 500 MW Dugar Hydroelectric Project in Chamba district.

Emerging Renewable Technologies

The Lok Sabha recently passed the Energy Conservation (Amendment) [Bill](#), 2022

relating to the greater use of renewable energy and imposing penalties on industrial polluters for carbon emissions. India has taken several steps to introduce newer renewable technologies to meet its energy goals.

Green Hydrogen

The [National Hydrogen Energy Mission \(NHM\)](#) has been established in India to develop a roadmap for the use of hydrogen as an energy source. Green hydrogen is particularly significant for renewable energy ambitions. Prime Minister Modi in his [address](#) on India's Independence Day 2021 announced the National Hydrogen Mission and India's potential as a producer and exporter of green hydrogen. The Green Hydrogen Policy was [notified](#) by the Ministry of Power in February 2022. It targets a production of five million metric tonnes per annum (MMTPA) of green hydrogen by 2030. In a recently released [Harnessing Green Hydrogen](#) report by the [Niti Aayog](#), it is estimated that green hydrogen can subside approximately 3.6 gigatons of cumulative CO2 emissions by 2050. There has also been a monumental [industrial](#) shift in the use of green hydrogen. Companies such as Reliance Industries Ltd.

and Indian Oil Corporation Ltd. have also announced the construction of green hydrogen plants in Jamnagar, Gujarat, and Uttar Pradesh.

Biofuels

It is pertinent to note that India has an annual [biomass supply of about 500 million tonnes](#), of which 120 to 150 million tonnes are surplus. The sole contribution of biofuels to renewable energy is around 12.83%. Further, by 2030 India also aims at [5% biodiesel blending](#). India further aims to support bio-fuel manufacturing as a part of the 'Make in India' initiative. In order to mitigate the petroleum supply-demand [gap](#) and increase energy independence, the government has also introduced several strategies on ethanol blending. In his 2022 Independence Day address, PM Modi announced that India has achieved its target of blending 10 per cent sugarcane-extracted ethanol in petrol, ahead of schedule. Efforts have been ramped up to supply petrol with [20 per cent](#) ethanol at selected location by next year. The E20 petrol (with 20 per cent blending) will be made available countrywide by 2025. In a similar bid, a Rs 900 crore 2G ethanol plant has been set up by the Indian Oil Corporation's (IOC) in [Panipat](#) to produce ethanol from second-

generation (2G) sources such as farm waste. Three more plants are planned in Odisha, Assam and Bathinda.

India's Electric Vehicle (EV) Sector

The government is working to transform [India into a global hub for the manufacturing of electric vehicles](#). It aims to have Electric Vehicle sales accounting to around 30% in the private sector, 70% in the commercial sector and 80% in two- and three-wheelers sector by 2030. In 2019, Faster Adoption and Manufacturing of Hybrid and Electric Vehicles ([FAME](#)) II scheme was adopted. It is noteworthy that FAME II policy, which is the umbrella policy for India, has been designed considering demand side incentives, where 86% of the funding is set aside for consumer incentives for EV purchases and 10% is allocated to fund charging infrastructure.

Prior to the FAME II scheme, in the [FAME 1](#), the Government of India had supported adoption of 2,78,000 EVs in different forms with a total incentive of INR 343 crore. EVs are becoming a central point for India's environment, energy and industrial policy combined. Around 20 states in India have already come up with either a draft or final state level electric vehicle policy, these state

policies overall aim to promote India's transition from ICE to EVs.

INDC Update

In August 2022, India's updated its Nationally Determined Contribution ([NDC](#)) goals after approval from the Cabinet. According to the update, "India has committed to reduce Emissions Intensity of its GDP by 45 percent by 2030, from 2005 level and achieve about 50 percent cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030". These will also be communicated to the United Nations Framework Convention on Climate Change (UNFCCC).

Non-Traditional Security Centre

This digest has been prepared by the Non-Traditional Security Centre, Manohar Parrikar Institute for Defence Studies and Analyses, New Delhi.



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Manohar Parrikar Institute for Defence Studies and Analyses

No.1, Development Enclave, Rao Tula Ram Marg,
Delhi Cantt., New Delhi - 110 010

Tel.: (91-11) 2671-7983 Fax: (91-11) 2615 4191

Website: <http://www.idsa.in>