

## **India's latest National Electricity Plan is ambitious and in line with climate commitments**

New Delhi: At the ongoing United Nations [Climate Change](#) Conference, [COP27](#), India released its long-term low-carbon development strategies. Low-carbon development of India's electricity systems is crucial because the [power](#) sector accounts for 45% of the country's total greenhouse gas (GHG) emissions (based on emission estimates published by the Ministry of Environment, Forest and Climate Change). The power sector is a key driver for decarbonising nearly all major energy-intensive sectors as it enables the shift to renewable energy-based electricity from the current fossil fuel-based processes.

Unlike other energy-intensive sectors, India's power sector is well placed in terms of plans. The Central Electricity Authority (CEA) published the draft [National Electricity Plan](#) (NEP) 2022 this September. The draft NEP presents the likely reduction in GHG emissions via clean energy transitions that can be expected in the Indian power sector until 2031–32. As the main theme of this year's COP is implementation, execution of the Paris Rulebook, we look at the draft NEP from an implementation perspective in this article. We also highlight the challenges encountered and lessons learned while implementing clean energy transition plans in the past.

To realise the climate goals, major revamps are required in the power sector. This implies that India's current annual capacity addition needs to be expanded about four times from the current 164 GW. Only 150 GW of non-fossil capacity is under construction or in the planned stage. The remaining projects need to be planned in the next 2 years to achieve the projected renewable energy (RE) capacity.

### **Battery storage**

At present, India is at a nascent stage in storage battery manufacturing. This will need to expand by more than 150 GWh by 2030 (from the negligible production capacity today). But high investment requirements and supply chain challenges for battery raw materials such as lithium, nickel, and cobalt are key barriers to the rapid upscaling of battery manufacturing capacity. Lowering import duties and taxes for imported battery components will enable the wide adoption of batteries in the next 2 to 3 years. Policymakers also need to attract investors for a massive scaling up of battery manufacturing in India. For a few initial projects, financial instruments — such as Viability Gap Funding — are worth considering with state and central governments. The scaling up of the current production-linked incentive scheme to more companies will increase the number of players in the battery manufacturing sector and aid in cost competitiveness. Along with these measures, the Government also needs to provide support for R&D and commercialisation of other storage technologies such as flow batteries, sodium sulphur, and compressed air energy systems. This will help in reducing raw material availability issues as these metals and minerals are available in abundance in India.

### **Delays in clearances**

In terms of other storage options, India has only 3.1 GW of pumped storage operational capacity and 2.7 GW of under-construction projects. A further 16.5 GW of planned capacity is under various stages of implementation. If we go by the time taken for environmental and construction clearances for pumped hydro storage projects in the past, delays are likely.

The power ministry is setting up a transmission infrastructure expansion plan of 300 GW by 2030 to

evacuate power from potential RE zones. Once this expansion plan is achieved, RE-based power can be evacuated easily. However, it is to be noted that most of the transmission system expansion plans in the past have been delayed because of land acquisition and funding issues. The flagship programme of the government to expand the transmission infrastructure for RE, the Green Corridor Phase I (initiated in 2013), was delayed by many years.

### **Reliance on coal and GHG emissions**

Even if proposed targets for non-fossil capacity additions are achieved, GHG emissions from the power sector are likely to be 30% higher compared to current levels by the end of 2031–32. This is owing to the continuous dependence on coal-based power plants to meet projected peak demands and base loads. It is important to note that 28 GW of additional coal capacity is projected in the next 10 years. This is over and above the 25 GW of plants that are under construction. Only 5 GW of coal plant capacity is considered for retirement during the next 5 years and, surprisingly, there is no retirement plan for the 2027–32 period. This implies that a majority of old and inefficient coal-based power plants are likely to operate until the end of this decade.

### **A holistic plan for implementation**

Complete independence from coal might take a few more decades, but in the meantime, coal-based power plants should be made compliant with environmental standards. The power ministry has indicated plans to make it compulsory for any new thermal power producer to set up equivalent RE capacity from April 2024. Achieving the projected non-fossil-based capacity additions and permitting a substantial share of RE in the electricity mix require a massive expansion of transmission and energy storage systems.

A holistic plan addressing past challenges—such as procedural delays, land acquisition challenges, and funding barriers—needs to be developed. Approval processes of RE projects (such as wind and solar) and energy storage projects need to be fast-tracked. To reduce land acquisition difficulties, a national database of available land parcels under public ownership needs to be established and land ownership records need to be digitised. This is crucial as many studies predict that around 65,000 to 1,00,000 sq. km of land (up to 11% of the total wasteland) will be required by 2050 for RE projects.

Decarbonising India's power sector is no mean task. Given the past difficulties and barriers, and the increasing land demand for competing uses, achieving the projected clean energy transition as outlined in the latest draft NEP will necessitate unwavering efforts and collaboration among multiple stakeholders, including policymakers, renewable energy companies, investors, battery manufacturers, and financial institutions. Shifting to a cleaner and eventually cheaper grid necessitates coordinated action in the coming decade, and the NEP is a good guiding document in the process.

**[This piece was written exclusively for ETEnergyworld by Upasna Ranjan and Roshna N, who work in the area of climate, environment, and sustainability at the Center for Study of Science, Technology and Policy (CSTEP), a research-based think tank]**