



## hybrid renewable storage cost breakdown in India 2030

Are energy storage technologies available in India? Finally, energy storage technologies may be available in India in the form of pumped hydro, which can be charged when electricity is in surplus, and discharged when fast flexibility is needed. How India is promoting the adoption of energy storage systems? India has begun to invest in energy storage and develop policy to support the development of battery storage. The Ministry of Power in India has taken a significant step in promoting the adoption of energy storage systems (ESS) by introducing an Energy Storage Obligation (ESO) alongside the Renewable Purchase Obligation (RPO). Could hydrogen energy storage help India transition to a full-scale decarbonisation pathway? Hydrogen energy storage technologies would play a key role when India transitions to a full-scale decarbonisation pathway beyond . The potential of hydrogen-based energy storage, especially for medium- and long-duration storage, is being pursued because of the technical advantages it brings in comparison to battery storage. Can energy storage provide operating reserves in the power system? Operational modeling of the power system shows energy storage can play a major role in providing operating reserves in the future power system and there are significant system benefits to allowing these technologies to do so. How many renewable power projects are there in India? The proportion of renewable power development in India developed under the IPP model is increasing. Current IPP plans for wind projects in India run to more than 24 GW. To date, the type and nature of support mechanisms provided by government has influenced the type of investor attracted to renewable projects. Will India reduce emissions by 35% by ? Since the Paris Agreement in , India has made significant strides in reducing emissions intensity by 33-35% by 2030. The country has set an enhanced target at the COP26 of 500 GW of non-fossil fuel-based energy by 2030. This has been a key pledge under the Panchamrit. Using scenario-based capacity expansion modeling to assess how much energy storage can be cost effectively deployed in India through , the study finds that energy storage becomes cost-competitive with other technologies due in part to projected cost declines through . Using scenario-based capacity expansion modeling to assess how much energy storage can be cost effectively deployed in India through , the study finds that energy storage becomes cost-competitive with other technologies due in part to projected cost declines through . Here, we conduct a review of grid-scale energy storage technologies, their technical specifications, current costs and cost projections, supply chain availability, scalability potential, and policy frameworks focused on the Indian market and contextualized in the global landscape. 1. Introduction Maintaining its position as the cheapest form - in terms of \$/kWh - of grid-scale energy storage. Of all countries here compared, costs are cheapest in India, which already hosts a large installed capacity of MW (the 7th largest in the world) with more projects in the pipeline (CEA ). It Battery prices are projected to fall by 60 per cent by , making storage more affordable. The government has committed US\$2.4 billion in subsidies under the National Green Hydrogen Mission, with a target of producing 5 million metric tonnes annually by . This alone will require 125 GW of The report, Strategic Pathways for Energy Storage in India Through , tackles these questions. With its sharp analysis and data-driven approach, it maps out practical, affordable ways

