

India's Clean Energy Transition Needs Wind in its Sails

How Strategic Policies, Repowering, and Hybrid Solutions Can Accelerate Growth

While solar energy has garnered significant attention in India's renewable energy discourse, wind power is equally critical—and poised to play a leading role in shaping the country's sustainable future. Of the 500 GW renewable energy target set for 2030, nearly 100 GW—about 20%—is expected to come from wind energy.

However, this represents just a fraction of India's actual onshore wind power potential, which is estimated at 695.5 GW at 120 meters and 1,163.9 GW at 150 meters above ground level. Yet, the cumulative installed wind capacity at the end of last year was only 48.2 GW, underscoring a significant gap—and a tremendous opportunity. Scaling up

wind power over the next five years is not only achievable but essential. The Central and State governments can support this growth through strategic budget allocations and well-directed policy interventions.



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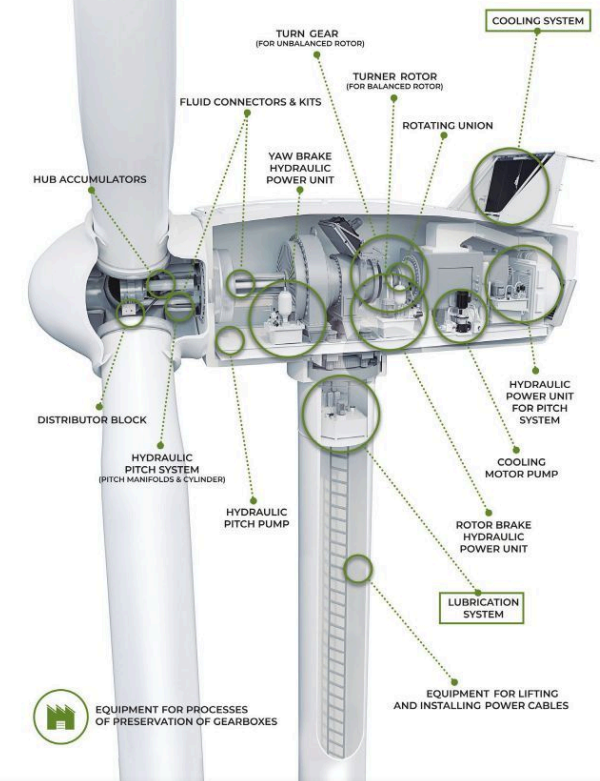
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Deeper collaboration between the Centre and States on policy interpretation and on-ground deployment will prove invaluable

What The Wind Sector Needs: Strategic Budgets, Clearer Policies, And Streamlined Processes

Scaling up wind energy capacity will require sustained investments in grid infrastructure, storage solutions and policy reforms. Encouragingly, the Central government has increased this year's budget allocation for the renewable energy sector by 53% compared to last year. The budget also supports the upgradation of high-voltage electrical equipment manufacturing and evacuation infrastructure to ensure smoother integration of wind energy into the national grid. In addition, there is a push for setting up renewable energy parks.

The acceleration of the adoption of policies announced by the Central government at the State level will significantly strengthen the implementation of wind energy projects

in the country. Deeper collaboration between the Centre and States on policy interpretation and on-ground deployment will prove invaluable to developers who work across different States, thereby leading to development of economically sustainable projects. As India advances toward decentralised energy generation, State governments will play a crucial role in developing robust intra-state transmission networks that will support this endeavor.

Wind power projects have a lifespan of ~25 years. Therefore, stable and transparent policies are crucial to encourage developers to invest in them. To start, the approval processes for land acquisition, grid connectivity, tariff adoption, and signing Power Purchase Agreements (PPAs) must be streamlined.

Revitalising Wind Energy Through Repowering

An important avenue for boosting wind power output is repowering—replacing

aging turbines with modern, high-capacity models to enhance generation within the existing land footprints. While the high cost of dismantling and upgrading old turbines presents a challenge, it can be addressed through tax benefits, concessional financing, and viability gap funding. The National Repowering & Life Extension Policy for Wind Power Projects – 2023 provides a structured approach to this effort, offering benefits such as micro-siting flexibility, preferential loans and financial support for replacing or refurbishing older turbines with more efficient alternatives.

Boosting Domestic Manufacturing Capacity

India already has a robust domestic manufacturing base for wind energy equipment, with an annual production capacity of around 15 GW. To fully leverage this advantage, policies must encourage the development and scaling up of next-generation wind turbine technologies. Strengthening domestic



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India holds vast untapped potential for offshore wind energy—estimated at around 70 GW along the coasts of Gujarat and Tamil Nadu alone

manufacturing will help position India as a global hub for wind energy equipment.

Initiatives like 'Make in India' can be expanded to support increased production capacity, alleviate supply chain constraints, reduce dependence on imports, and enhance export competitiveness in the global wind energy market.

Offshore Wind

With a coastline stretching over 7,600 km, India holds vast untapped potential for offshore wind energy—estimated at around 70 GW along the coasts of Gujarat and Tamil Nadu alone. Gujarat offers ~36 GW, while Tamil Nadu around 35 GW. India must capitalise on this potential. The viability gap funding scheme announced by the government for 1,000 MW of offshore wind projects is a promising step forward and is expected to give impetus to efforts in this direction.

Hybrid Projects Combine The Best Of Wind And Solar To Provide Reliable Power

Hybrid energy projects harness the strengths of both wind and solar to deliver reliable power. Wind energy naturally complements solar generation, by providing vital support during non-solar hours. A well-designed mix of solar, wind, and energy storage is among the most cost-effective ways to meet firm energy requirements, and India's

National Wind-Solar Hybrid Policy offers a strong framework to guide this transition.

By combining the benefits of both sources, hybrid systems offer stable power at affordable rates. These projects also boast significantly higher Capacity Utilisation Factors (CUFs)—ranging between 35–50%—compared to standalone wind or solar installations.

Establishing more hybrid power plants is critical to accelerating India's clean energy goals. With growing interest from developers, there is a healthy competition for sites that offer both high solar irradiance and strong wind

potential. As Battery Energy Storage System (BESS) technology continues to evolve, hybrid projects are set to become even more efficient and impactful.

In Conclusion

Wind energy holds tremendous potential in India's clean energy transition. Whether as a standalone solution or as part of hybrid systems that augments solar power, wind must be a core pillar in the country's energy strategy. Strong collaboration between policymakers and industry stakeholders will be key to ensuring wind energy supports both India's renewable energy ambitions and its long-term energy security.

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Neeraj is a seasoned power sector professional with over 25 years of extensive techno-commercial experience in the power industry. His expertise spans business development, regulatory affairs, policy advocacy, project appraisal, contract negotiation, and contract management. Neeraj has played a pivotal role in numerous transactions within the power generation and transmission sectors, and has been instrumental in steering projects through their entire lifecycle—from conceptualisation to revenue stabilisation. Neeraj began his professional journey in the government sector, focusing on power distribution, before transitioning to the private sector where he has worked with some of the leading infrastructure giants, including Larsen & Toubro. Currently, he is at the helm of Business and Project Development initiatives at Apraava Energy.

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