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Latika Lakhani Kukreja  
Assistant General Manager -  
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Luminous Power Technologies

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# NAVEEN MUNJAL

*Director – BD & Commercial  
Apraava Energy*



We aim to invest an equivalent of ~1 GW per year in India's energy sector for the next few years. Along with pure renewable energy projects, we plan to participate in standalone BESS projects and hybrid projects that combine storage, solar, and wind, said **Naveen Munjal, Director – BD & Commercial, Apraava Energy**, in an interview with Energetica India.

**Q** From your perspective, what do you see as the biggest drivers and roadblocks in India's shift toward low-carbon energy?

**Naveen Munjal:** India's installed renewable energy capacity surpassed 230 GW as of August 2025, with nearly 50 percent of the 2030 clean energy target of 500 GW already achieved, five years ahead of schedule. India's shift toward low-carbon energy is being propelled by a clear national vision supported by strong policies such as Renewable Purchase Obligations (RPOs), centralised tendering that effectively aggregates demand, and a culture of frugal engineering and optimisations. Demand-side momentum is also rising with GDP growth, an expanding middle class, the falling cost of renewable power paired with battery energy storage systems (BESS), and emerging applications such as electric mobility and early green hydrogen pilots—all of which increasingly rely on renewable energy.

However, a few bottlenecks require urgent attention to sustain this momentum. Transmission constraints remain one of the most significant structural roadblocks. On the application side, the pace of adoption of electric vehicles and green hydrogen has been slower than expected, with green hydrogen still around three times more expensive than grey hydrogen. As per recent reports, nearly 40 GW of bid and allotted PPAs remain unsigned with Renewable Energy Implementing

Agencies (REIAs), with delays stretching well beyond a year in many cases. These prolonged timelines affect project costs, planning, and overall viability. A clear framework to reduce the time between bidding and PPA signing will be important. In addition, the absence of new grid connectivity allotments until 2030-31 has created uncertainty in tariff discovery and project planning. Land acquisition challenges, evolving RoW charges, and delays in transmission infrastructure continue to further affect project execution timelines.

**Q** Can you share your short- and medium-term plans for expanding wind and solar energy? What excites you most about these projects?

**Naveen Munjal:** Our current renewable energy operating portfolio stands at 1,450 MW, which includes 1,200 MW of wind and 250 MW of solar capacity. An additional 850 MW of renewable capacity is at various stages of construction, including two solar projects in Rajasthan of 300 MW and 250 MW, and a 300 MW wind project in Karnataka.

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At present, the limited capacity of evacuation systems and transmission lines is one of the biggest constraints for the RE sector. We intend to expand our portfolio to include substations and transmission lines, which will help strengthen India's renewable energy ecosystem.

In the near to medium term, integrating Fixed and Dispatchable Renewable Energy (FDRE) is imperative for the grid stability and reliability. Apraava remains committed to partnering with India to achieve its renewable energy and net-zero goals and to contribute to nation building by delivering reliable, sustainable, and affordable energy solutions.

**Q** How do you think smart metering and digital grids are changing the way India manages and consumes electricity?

**Naveen Munjal:** Smart metering and digital grid technologies are playing a crucial role in modernising India's electricity distribution sector. Today, the electricity grid is expected to do far more than supply power. With the rapid growth of electric vehicles and rooftop solar, grids must now interact with homes, buildings and vehicles in new and innovative ways.

The adoption of smart meters in India has gained strong momentum and represents a major opportunity to enhance energy security, improve power reliability and drive digital transformation across the sector. Under the government's Revamped Distribution Sector Scheme (RDSS) and Smart Meter National Programme (SMNP), India aims to replace 25 crore (250 million) traditional electricity meters with smart meters over the next couple of years. This initiative seeks to reduce commercial losses, improve billing accuracy and enhance energy efficiency by enabling real-time data monitoring and prepaid billing for consumers, while also supporting renewable energy integration and the broader modernisation of the country's power infrastructure.

Digital grids, supported by Distribution Management Systems (DMS), act as central hubs that integrate smart metering, energy management, renewable energy, storage and EV charging. As the grid begins interacting with more homes, buildings and electric vehicles, these technologies enable re-

al-time loss detection, strengthen the benefits of net metering and help consumers become "prosumers" through rooftop solar adoption. Future advancements in blockchain, IoT and microgrids will further enhance these capabilities by enabling peer-to-peer energy trading and smarter, more resilient grid management.

**Q** How important are greenfield transmission projects in making sure renewable energy reaches the people who need it?

**Naveen Munjal:** Greenfield transmission projects form an integral part of India's energy transition journey. As renewable energy generation expands rapidly, the ability to move this power efficiently from resource-rich regions to demand centres becomes crucial.

The Government's National Electricity Plan (2023–2032) sets out the need for rapid expansion of Inter-State Transmission System (ISTS) and intra-state networks to meet a projected peak demand of 458 GW by 2032. With renewable capacity now surpassing 230 GW, upgraded transmission corridors such as High-voltage direct current (HVDC) lines are enabling power generated in remote regions like Rajasthan and Gujarat to reach major urban demand centres.

To build an efficient and reliable transmission system, the deployment of advanced technologies such as Flexible AC Transmission Systems (FACTS) devices, synchronous condensers and smart-grid solutions like real-time monitoring, AI-based predictive maintenance and weather-linked optimisation will be key.

**Q** How are technologies like energy storage, digital twins, or predictive maintenance making operations more efficient and reliable in real-world projects?

**Naveen Munjal:** Energy storage is vital for enhancing grid reliability, particularly as renewable energy sources like solar and wind become more integrated into the power system. With the rapid addition of solar capacity, the grid experiences surplus energy during the day and a sharp deficit in the evening, when solar generation drops and demand rises. Energy



storage systems help stabilise the grid by storing excess energy during low-demand periods and releasing it during peak hours, thereby improving reliability and balancing supply.

Energy storage also supports the development of microgrids, making the overall system more resilient. Its deployment enables state utilities to provide more reliable service, reduce blackouts and help large power users and critical infrastructure manage peak bills and maintain operations during outages, even under extreme weather conditions. The steady increase in storage tenders in recent years reflects its growing importance.

As project sizes and portfolios expand, there is a growing need for technologies that can monitor asset performance autonomously, with minimal human intervention. Digital twins use real-time sensor data and historical performance information to predict equipment failures before they occur and optimise operations. When combined with predictive maintenance, they enable real-time monitoring, fault detection and lifecycle simulations that help identify defects early, improve maintenance scheduling and extend asset life. This significantly reduces downtime and enhances overall performance. As industries adopt these technologies more widely, maintenance will continue to shift from traditional reactive methods to a more proactive and data-driven model.

**Q** Looking ahead, what policy changes or market trends do you think will shape the Indian energy sector most over the next 5–10 years?

**Naveen Munjal:** Over the next decade, the Indian energy sector will increasingly shift toward integrated renewable energy solutions, greater self-reliance and deeper digital transformation. We expect to see more FDRE bids replacing stand-alone wind and solar tenders, with energy storage playing an essential role in greening the grid and supporting India's NDC commitments.

A key priority in achieving India's energy targets will be reducing crude oil import dependency, which currently stands at ~85 percent. Other major themes include the expansion of green hydrogen, upgrades in power distribution, continued renewable capacity additions, grid reliability, large-scale energy storage and broader decarbonisation efforts, including the emergence of nuclear energy as a viable low-carbon option.

Accelerated digitalisation through AI, smart meters and advanced analytics will create valuable data that improves planning and operations. Policy initiatives must focus on state-level just transition roadmaps, workforce skilling and legal safeguards for fossil-fuel workers, localisation of manufacturing, easing land acquisition processes and stronger ESG norms.