# Engage Echo: Power Equipment

## Experts' take on wind energy outlook for FY27 and beyond

**India added 6.1GW of wind energy capacity during FY26, marking its highest-ever. Presently 25–30GW of wind projects are under construction, of which about 10GW have PPAs and are slated for commissioning in FY27E. To gain insights into the wind energy outlook for FY27 and beyond, as well as commodity inflation, competition, and developments in energy storage (BESS), we hosted the Chief Business Officer (India) of one of the world's largest wind OEMs and Mr. Sidharth Jain, MD – MEC Consulting.**

- **Structural shift in RE market**: The market is moving away from a pure capacity addition mindset towards overall system optimisation and maximising actual energy delivered to the grid.
- **Grid regulations are becoming stricter**: Grid operators are becoming more sensitive to stability issues, leading to tighter commissioning requirements and stricter operational norms (narrower DSM bands).
- **Slowdown in RE bidding activity**: The slowdown needs to be seen in the context of very high bidding activity (>50GW/year) in the previous two years. Demand remains strong and has partially shifted toward the C&I segment. So, the market is not slowing structurally; it is simply transitioning.
- **Growth steady rather than sharply accelerating**: Wind order inflows have been strong at 12–13GW annually over the past two years. FY26 installations crossed 6GW for a first time and, going forward, annual additions are expected to remain 6–8GW due to execution challenges.
- **Outlook for BESS addition**: A key driver is the change in China's export VAT regime. Effective April FY26, export incentives worsened by about 3%, and there is expected to be additional 6% impact from Jan'27, taking the total cost impact to roughly 9%. As a result, suppliers and developers are trying to accelerate shipments before further cost increases take effect. The battery storage deployment could reach 10–12GWh in 2027.
- **Equipment manufacturing**: Despite capacity appearing higher (15GW), the industry is not seeing severe competitive pressure. Wind manufacturing is relatively asset-light and mainly involves assembly of turbines. Much of the production process – particularly towers, blades – can be scaled up flexibly without large investments, allowing manufacturers to adjust capacity more smoothly.
- **Bottlenecks in execution**: The primary constraints are land acquisition and grid connectivity. Wind projects require specific locations with adequate wind resources, and acquiring fragmented land parcels takes time.
- **Cost pressures such as steel prices and currency**: Even with a sharp increase in steel prices, the overall turbine cost impact is 2–3%, which is manageable. Currency impact is modest and not seen as a major margin risk.
- **Issues with new DSM regulations**: Forecasting in wind and solar remains inherently difficult. The issue is not necessarily with tighter regulations *per se*, but with applying them retroactively to projects that were developed under a different regulatory framework.
- **Wind versus solar + battery storage**: Solar combined with battery offers flexibility and ease of deployment, but it is still more expensive than standalone wind. Wind remains essential, particularly in high-quality hybrid projects that aim to deliver reliable power.
- **Recent price hikes in BESS**: The recent increase of USD 10/kWh is painful for some developers that assumed BESS would follow the solar story. Prices may stabilise or soften marginally, but the steep downward trajectory seen until late 2025 is unlikely to return anytime soon. India could see about 10GWh or more of DC battery container shipments from China before Dec'26.

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# Wind energy outlook: FY27 and beyond

India added 6.1GW of wind energy capacity during FY26, its highest-ever. Presently, 25–30GW of wind projects are under construction, out of which about 10GW have PPAs and slated for commissioning in FY27E. To assess the confidence of the industry to meet another milestone, we had the privilege of hosting Chief Business Officer (India) of one of the world's largest wind OEMs and Mr Sidharth Jain, MD – MEC Consulting.

## Structural shift in RE market

The market is clearly moving away from a pure capacity addition mindset towards overall system optimisation. Earlier, the focus was on installing as much capacity as possible, but now the emphasis is on reducing total costs and maximising the actual energy delivered to the grid. This includes better design of projects, improved efficiency and smarter integration of technologies.

This transition is most visible in the move from standalone wind or solar projects to hybrid solutions. Over the last few years, developers have increasingly combined wind, solar and battery storage to improve generation consistency and grid reliability. More recently, "hybrid-plus" models have emerged, wherein projects are oversized and integrated with storage to deliver firm and dispatchable power. So, even if tender volumes appear lower, the actual capacity required per project is rising.

## Grid regulations becoming stricter

As RE penetration increases, grid operators are becoming more sensitive to stability issues. This has led to tighter commissioning requirements and stricter operational norms, including narrower deviation settlement bands (DSM) and compliance standards such as LVRT/HVRT. While this creates short-term challenges for developers, it is a necessary evolution to ensure long-term grid stability. Such regulation reflects the maturity of the sector, not a factor slowing it down.

## Slowdown in RE bidding activity?

Not really. The slowdown needs to be seen in the context of very high bidding activity in the previous two years. Additionally, grid constraints and the removal of ISTS charge waivers have created temporary uncertainty, delaying some project signings. However, demand remains strong and has partly shifted toward the C&I segment. So, the market is not slowing structurally; it is simply transitioning.

## Outlook for the wind and battery storage sector

Wind order inflows have been strong at 12–13GW annually over the past two years. However, execution takes time due to land and grid challenges. Recently, FY26 installations crossed 6GW for a first time, and going forward, annual additions are expected to be 6–8GW. Growth is likely to be steady rather than sharply accelerating.

The battery storage deployment could reach 10–12GWh. The biggest trend will be the increasing importance of hybrid and storage-integrated solutions. While execution challenges such as land and grid constraints persist, the long-term outlook remains positive driven by strong demand and continued policy support.

## Equipment manufacturing capacity

India has about 15GW of wind turbine manufacturing nameplate capacity. Despite capacity appearing higher than current demand, the industry is not seeing severe competitive pressure. Wind manufacturing is asset-light vis-à-vis heavy industries since OEMs mainly assemble turbines while sourcing key components such as generators, gearboxes, bearings, and control systems. Much of the production process — particularly for towers and blades — can be scaled up flexibly without incurring large investments, allowing manufacturers to adjust capacity more smoothly.

The main near-term challenge is not manufacturing capacity *per se*, but localisation under the new MNRE norms. Instead of broad localisation targets, MNRE focused on a few key components that together account for nearly 70–75% of turbine value. Towers and blades are already well established domestically, and generators are not seen as a constraint even as gearboxes and bearings are gradually scaling up in India.

## Execution bottlenecks in wind energy projects

The primary constraints are land acquisition and grid connectivity. Wind projects require specific locations with adequate wind resources, and acquiring fragmented land parcels takes time. Additionally, grid infrastructure is not always available where projects are planned. These factors limit execution, even though underlying demand for wind capacity remains strong.

## Cost pressures such as steel prices and currency

**Sizing up steel price impact**

A key question today is how the spike in commodity prices – particularly steel, a major input in wind ecosystem – could affect equipment manufacturers' profitability and overall LCoE of wind power.

One important offsetting factor is the ongoing transition towards larger turbines. The industry is rapidly moving from 3MW platforms to 4MW and even 5MW turbines. While capex does increase with larger machines, the increase is not proportional to the gain in energy generation. As a result, LCoE economics continues to be attractive, and many previously bid projects can still stay profitable even after moderate cost inflation.

At the same time, this is not a new situation for the industry. Wind equipment manufacturing has always been cyclical, and suppliers are accustomed to managing commodity volatility through hedging and contractual adjustments. If elevated raw material prices persist for longer periods, future pricing revisions can also be passed through gradually.

From an OEM's perspective, the direct impact of steel inflation is somewhat contained because steel primarily affects tower manufacturing. Most other turbine components involve substantial engineering and value addition, so raw material fluctuations do not proportionately affect their costs.

Typically, towers account for roughly 25% of total turbine value. Even with a sharp increase in steel prices, the overall turbine cost impact works out to 2–3%. That is meaningful, but still manageable within the broader project economics.

Manufacturers are, therefore, focusing on securing better supply visibility and negotiating improved pricing arrangements with steel plate vendors to reduce volatility and preserve margins.

**Sizing up INR depreciation impact**

The impact of currency depreciation is now significantly lower than it used to be because localisation levels have steadily improved. Still, there is some import dependence in the wind sector, so currency movements do have impact on margins. In the recent past, the sharp depreciation of the INR has created some near-term cost pressure for manufacturers. However, the industry views this more as a temporary macro issue rather than a structural concern and is managing it.

Going forward, nearly 75% of turbine value is expected to be sourced domestically, which means only about 25% of the turbine cost remains exposed to imports.

Even with the INR weakening from roughly 90 to 93 against the dollar, implying depreciation of about 3–3.5%, the effective impact on overall turbine cost works out to less than 1% (around 0.75%).

So compared to steel inflation, the currency impact is relatively modest and currently not seen as a major margin risk for the industry.

## Controversy around new DSM (Deviation Settlement Mechanism) regulations

The main concern for IPPs is the retroactive application of stricter DSM norms. Forecasting in wind and solar remains inherently difficult, and real-time forecasting capabilities are still limited. Broadly, there are two ways to manage renewable intermittency: either balance variability at the grid/system level through diversified energy procurement or shift the responsibility to developers by imposing strict supply compliance obligations.

Currently, IPPs are under increasing pressure to absorb this balancing responsibility. That raises operating costs, which eventually flow through into tariffs. The issue is not necessarily with tighter regulations *per se*, but with applying them retroactively to projects that were developed under a different regulatory framework.

This has become a key sticking point for the industry, and several petitions have already been filed challenging these provisions. The concern is that if such measures continue without adequate transition mechanisms, they could materially affect project economics and investor sentiment.

## Wind versus solar + battery storage

Solar combined with battery storage offers flexibility and ease of deployment, but it is still more expensive than standalone wind. Wind, on the other hand, is cost-effective, but more difficult to execute due to location-specific constraints. As a result, both technologies are complementary. Wind remains essential, particularly in high-quality hybrid projects that aim to deliver reliable power.

## Recent price hikes in battery storage (BESS)

There has clearly been an increase in BESS pricing, although exact numbers vary across suppliers and configurations. Broadly, the industry has seen a cost impact of roughly USD 10/kWh due to increases in the prices of key raw materials and components. This has become a significant issue because many project bids were based on assumptions that battery prices would continue to fall, like the trajectory witnessed in solar over the past decade.

In fact, battery price declines had initially been even sharper than what solar experienced, emboldening developers to bid aggressively in anticipation of cost reductions over the 18–24 months typically available prior to commissioning. However, that trend has now reversed completely. Rising lithium carbonate prices and broader supply-chain pressures have raised serious questions about the viability of several projects, particularly standalone storage projects and some solar + storage bids awarded during FY25 and FY26.

On the outlook for battery prices, the view is that prices may stabilise or soften marginally, but the steep downward trajectory seen until late 2025 is unlikely to return anytime soon. The industry no longer expects the kind of rapid and continuous cost declines that developers had previously built into their assumptions.

As for deployment trends in India, the industry is expected to see sizable BESS deliveries during 2026. A key driver is the change in China's export VAT regime. Effective April FY26, export incentives effectively worsened by about 3%, and from Jan'27 there is expected to be an additional 6% impact, taking the total cost effect to roughly 9%.

As a result, suppliers and developers are trying to accelerate shipments before further cost increases take effect. Industry estimates suggest that India could see around 10GWh or more of DC battery container shipments from China before Dec'26, followed by phased commissioning.

Another reason for accelerated deliveries in Q4 is the fact that calendar degradation in winter is lower, effectively bring in flexibility for taking delivery a few months before commissioning.

# APPENDIX I

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