Things are changing for India's wind energy sector. Image: Getty Images

LONG READS

Return of Wind

India's wind sector, going through a rough patch, is set for a rebound as the Centre tweaks auction policy, plans offshore wind projects and focuses on replacing old mills.

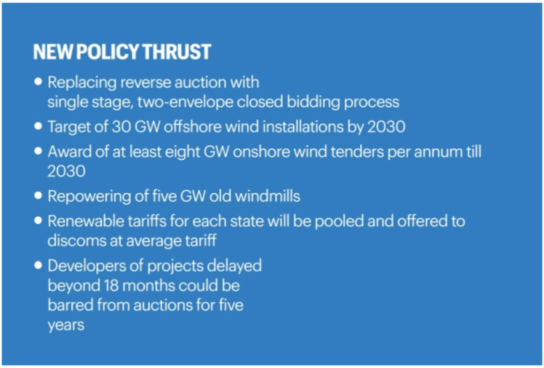
By **P B JAYAKUMAR** AND **NEVIN JOHN**, **Jul 5, 2023** | 13 min read

THE 350-PLUS EMPLOYEES of wind energy major Suzlon Energy's nacelle and electrical assembly unit at Dunetha village in Daman are looking forward to return of prosperity. They know their unit's importance in Suzlon's manufacturing prowess — about 3,150 MW capacity for wind turbine parts. Nacelles, sitting on top of 120-140 metres high lattice and tubular tower structures at wind farms, house power generating components such as generator, gearbox, braking system and electrical assembly. The Daman unit gives life to 100 tonnes wind turbine generators or WTGs.

When Suzlon was growing fast from 2004 to 2010, this was a 100% export unit, capable of making three machines a day. Suzlon's financial troubles forced it to focus on local market. Orders have been erratic for the past five years. Suzlon had two similar units at Pondicherry and Udupi which are not operational.

All that started changing five-eight months ago. Now, the bays are bustling with action. "We hope to reach peak production (three units a day) by Q3 or Q4 of this financial year. We have upgraded the unit to make three gigawatt (GW) machines from earlier two GW. The plan is to assemble next-generation machines up to five GW," says Atul Kumar Singh, vice president, operations, at the unit.

INOXGFL Group's INOX Wind, another leading domestic manufacturer of wind turbines, is also in a sweet spot. Its manufacturing plants at Rohika and Bhuj in Gujarat, Barwani in Madhya Pradesh and Una in Himachal Pradesh are witnessing increased utilisation. The company is bouncing back after a lack of orders and mounting losses over past four-five years. "Numerous corporates and marquee PSUs are investing in wind energy. We already have a significant order book of over 1,200 MW, good enough to run our plants at high utilisation over the next two years. We will be back to our historical revenues and profit levels within the next few quarters," says Devansh Jain, executive director, INOXGFL Group.



NEW POLICY THRUST

- Replacing reverse auction with single stage, two-envelope closed bidding process
- Target of 30 GW offshore wind installations by 2030
- Award of at least eight GW onshore wind tenders per annum till 2030
- Repowering of five GW old windmills
- Renewable tariffs for each state will be pooled and offered to discoms at average tariff
- Developers of projects delayed beyond 18 months could be barred from auctions for five years

Like Suzlon and INOXGFL, other wind equipment players such as Siemens-Gamesa, Vestas, Enercon and GE Renewable Energy are buzzing too, proving that after a gap of more than five years, things are changing for India's wind energy sector, the fourth-largest in the world. The revival came after the government shifted to the 'closed bidding' method where bidders do not have to further outbid each other after initial offers are opened, as was the case with the earlier 'reverse bidding' method introduced in 2017. The reverse bidding rule had badly hit the sector and led to just 1.6 GW per annum wind capacity addition per year in five fiscals till 2022 compared to 8.3 GW solar capacity addition. Prior to that, India was adding three-four GW wind capacity a year. Now, new tendering norms, along with some policy initiatives, are setting the stage for eight GW bids a year from FY24 to FY30. With wind projects taking 20-24 months to get commissioned, India can expect addition of six-eight GW wind capacity every year starting FY26.

"It will be an exciting time for renewable energy sector in India. The thrust will be on more efficient hybrid projects of wind, solar and pumped hydro for resolving grid stability issues during peak hour demand," says Sumant Sinha, chairman and CEO of ReNew, one of India's largest independent renewable power producers. "The setback due to 'bid-in tariff' cost Indian wind industry a lot. Now it is time for it to prosper because policies and regulatory guidelines are getting in place," says P.K.C. Bose, vice chairman and managing director at Enercon Wind Energy. Here's how the government is changing the dynamics for wind turbine makers.

Crash and Revival

India's cumulative renewable energy capacity (excluding 47 GW large hydro) was 125 GW on March 31, 2023, of which solar was the largest with 66.7 GW, followed by wind (42.6 GW). In FY23, India added 12.7 GW solar, but only 2.27 GW wind, thanks to the introduction of reverse auctions. This was hurting its chances of building 500 GW renewable capacity (140 GW wind) by 2030 as part of Prime Minister Narendra Modi's commitment at COP26 Summit in Glasgow for producing half the energy from renewable sources by then.

"In coming quarters, you will start hearing good news on Suzlon. Pooled tariff will bring demand from all states"

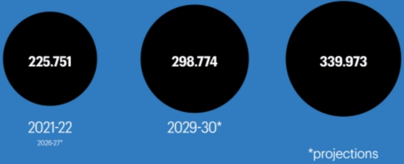
J.P. Chalasani, group CEO, Suzlon

"There was a transition from a relatively high tariff of ₹4-5 per unit to a more competitive tariff of ₹2.5-3 per unit. This reduced profitability of wind power projects," says a PRS Legislative Research Standing Committee report on wind energy. Industry sources say some developers resorted to aggressive bidding and backed out of projects after bringing down prices to unsustainable levels. The low tariffs left little incentive for developers to complete the projects. Delays in land acquisition and setting up evacuation infrastructure also affected projects. Only 41% projects awarded by Solar Energy Corporation of India (SECI), the nodal agency for tendering wind projects, during FY18 to FY21 were commissioned till December 2022. While 23% were cancelled, the rest were delayed due to land acquisition and evacuation/supply-side constraints, says a Crisil Research report.

Take Suzlon. The company has 20 GW capacity globally and 33% market share in India. Fast globalisation after 2005 made it one of the top six global onshore turbine makers with ₹26,000 crore revenues and ₹1,600 crore net profit in FY09. In 2008-2009, when markets were crashing across the globe, Suzlon was rattled by allegations of cracks in turbine blades of some of its U.S. wind farms. Costly big acquisitions like RE Power burdened its balance sheet. Revenues fell to ₹9,000 crore in FY15 and ₹3,000 crore in FY20 (with losses amounting to over ₹2,600 crore). The company had to restructure debt five times. Sun Pharmaceuticals promoter Dilip Shanghvi bought 23% stake for ₹1,800 crore as market capitalisation crumbled to ₹8,000 crore from ₹68,000 crore in 2010.

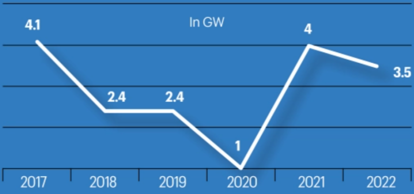
Now, bad days are seemingly over for Suzlon. Revenues shot up from ₹2,933 crore in FY20 to ₹5,947 crore in FY23. PAT before exceptional items turned positive after six years (₹167 crore). Share prices almost doubled from mid-May to mid-June. Order book has doubled in last two months from 652 MW to 1,542 MW. "In coming quarters, you will start hearing good news on Suzlon," says group CEO J.P. Chalasani. Net debt fell from ₹13,003 crore in FY20 to ₹1,180 crore in FY23, thanks to the recent rights issue and refinancing in May 2022 that replaced 16 lenders with just two.

Another domestic major that has got fresh wind beneath its sails is Inox Wind. After making it big in areas like industrial gases, multiplex chains, cryogenic engineering and fluorochemicals, in 2007-08, the New Delhi-based group decided to diversify into future businesses and identified WTG manufacturing as a big opportunity. It entrusted the responsibility to Devansh Jain, the family's third-generation scion who, within five-six years, built one of the largest wind turbine companies in India and one of the most cost-effective WTG makers in the world. Consequently, Inox Wind's revenues went up from ₹1,567 crore in FY14 to ₹4,414 crore in FY16. Market capitalisation of the company, listed in 2015, shot up to over $1.5 billion. But after the change in the auction policy in 2017, its machines had few takers. Over 1,000 MW orders remained on paper, suppliers backed out and inventories started piling up. "It was the toughest period," says Devansh Jain. In FY18, Inox Wind's revenues were only ₹480 crore, with a loss of ₹187 crore. The market cap shrunk to $300 million. FY22 revenues were ₹624.62 crore with losses at ₹429.80 crore. Now, remarkable orders have started coming back–Inox Wind has significantly reduced its debt, listed its renewable asset operations & maintenance company and is starting afresh. Recently, the holding company, Inox Wind Energy, was merged with Inox Wind to simplify and streamline group structure, reduce costs and improve efficiencies of the renewables business of the group.

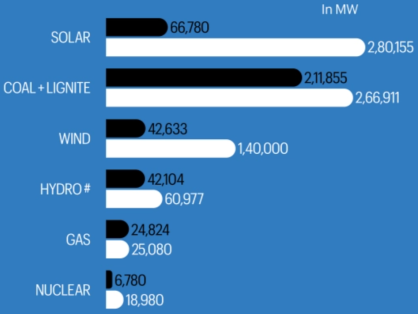


ELECTRICITY DEMAND TO RISE 33%

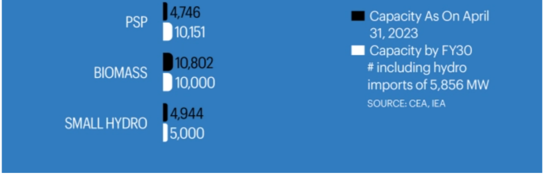
Peak demand (in GW)



WIND CAPACITY ADDITION HAS SLOWED SINCE 2017...



..BUT WILL ACCOUNT FOR 17% MIX BY FY30



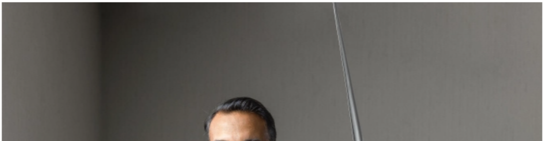
SOURCE: CEA, IEA

Remedial Measures

New auction policy is not the only way the government is trying to help the wind power sector perform better. It has also decided to award more projects to meet its renewable energy targets — at least eight GW wind tenders per year till 2030. Also, to ensure that higher wind power tariffs are conducive for state discoms, ministry of new and renewable energy (MNRE) has mandated that discovered renewable tariffs for each state will be pooled and offered to discoms at an average tariff by an intermediary such SECI to lower risk for developers. The rationale is that SECI fares significantly better than state discoms in paying dues. "Earlier, wind energy producing states (like Rajasthan, Gujarat, Maharashtra, Tamil Nadu and Karnataka) had an advantage as the power purchased was not distributed nation-wide. The pooled tariff system will bring demand from all states," says Chalasani of Suzlon. The government has also waived off Inter State Transmission System charges for inter-state sale of solar and wind power for projects to be commissioned by June 30, 2025.

Apart from all this, MNRE has decided to revoke bank guarantees of developers if they delay a project by more than a year. Developers could be barred for five years if they delay a project beyond 18 months.

"Six-eight GW capacity can be installed every year starting fiscal 2026. Annual installations could be lower than tender volumes if historical issues such as delays in land acquisition and setting up of power evacuation persist," says Ankit Hakhu, director, CRISIL Ratings. It expects tariffs to rise 20-30% over recent ₹2.89-2.94 per unit (to provide more than 10% internal rate of return). "Currently, 11 GW wind projects are under construction and we expect that demand from three markets (central, state and commercial/industrial) will lead to 20-25 GW new wind installations in next five years," says Rakesh Kalsi, managing director, Infrastructure Practice of TruBoard Partners, a real asset management services firm which manages one GW renewable energy assets on behalf of global equity investors.



> “It will be an exciting time for renewable energy sector in India. The thrust will be on more efficient hybrid projects”
>
> Sumant Sinha, chairman and CEO, ReNew

Image : Photograph by Narendra Bisht

Repowering the Old

Another opportunity that wind players can tap is repowering old windmills that are at the end of their lifecycle. The government says most wind turbines installed in India till year 2000 have sub-MW capacity. Many are reaching the end of their life. These also have lower hub heights of 30-60 metres compared to 120-140 metres height of modern machines.

Since most of these windmills have been installed at sites with high potential, the government wants to repower them with higher capacity/efficiency turbines. National Institute Of Wind Energy has pegged repowering potential above 25 GW (25,000 MW). The ministry's draft 'National Repowering Policy For Wind Power Projects–2022' may pave the way for replacing about five GW old windmills and bring investments worth ₹40,000 crore (including cost of acquiring and dismantling old plants) over three-five years.

Offshore Wind

The first offshore wind turbine came up in Denmark in 1991. Offshore wind is popular in over 18 countries while India, with a coastline of about 7,600 km, is yet to have any commercial offshore wind project. To rectify the situation, the government came up with a "National Offshore Wind Energy Policy" in 2015 for "development and use of maritime space within the exclusive economic zone of the country."

Offshore wind turbines are much larger, 8-14 MW, than onshore turbines (two-three MW). While per MW cost of offshore is higher because of need for stronger structures and foundations, it is possible to reach desirable tariffs on account of higher efficiencies of these turbines, feels the government. India has set a target of 30 GW offshore wind capacity by 2030. Two projects supported by European Union are underway. MNRE has also collaborated with Danish Energy Agency to set up a centre of excellence for offshore wind and renewable energy. It has identified 15 zones for the first offshore wind development project.

The government has come up with tenders to offer four GW offshore wind energy blocks per year starting current year. These projects will come up in Dhanushkodi in Tamil Nadu and in Saurashtra, South Gujarat and Gulf of Khambhat coastlines of Gujarat. The government will then tender five GW per year for the next five years. Experts say it will take two-three years for offshore projects to take off. The biggest challenge is that the investment will require tariffs of ₹7-8 per unit to be viable. Onshore wind is available around ₹2 per unit.

"We have an order book of over

> 1,200 MW, good enough to run the plants at high utilisation over next two years”
>
> Devansh Jain, executive director, INOXGFL Group

Image : Photograph by Sanjay Rawat

MNCs Make A Comeback

While the switch to the new tendering system in 2017 broke many India focussed companies like Suzlon and Inox Wind, multinational companies operating in the country like Siemens-Gamesa, Vestas, Enercon and GE Renewable Energy started focusing on exports from where they were getting high-value orders.

With onshore wind energy market making a strong comeback, MNCs have also started getting major orders for local markets. Denmark-based wind turbine manufacturer Vestas, present in India since 1997, has got an order from Hyderabad-based Vibrant Energy for 36 machines of 3.6 MW capacity for a 300 MW wind-solar hybrid power project in India for Amazon. Vestas has a nacelle facility in Chennai and a blade factory in Ahmedabad. Similarly, market leader Siemens Gamesa recently got an order from AM Green Energy, a joint venture of ArcelorMittal-Nippon Steel, to supply wind turbines for a 166 MW project in Andhra Pradesh. Siemens Gamesa has been in India since 2009 and is a leader with 40% market share and installed base of over 8 GW, according to consultancy Wood Mackenzie. It has a blade factory in Nellore (Andhra Pradesh), a nacelle factory in Mamandur (Chennai) and an operations and maintenance centre in Red Hills (Chennai).

GE Vernova builds machines that suit India's low wind speeds. GE installed over 50% of new wind capacity in the country last year, says Deepak Maloo, regional sales leader for GE Vernova's onshore wind business in Asia Pacific. He says GE Vernova will leverage GE's footprint in India.

Enercon, the second-biggest wind turbine maker in Europe behind Vestas, had returned to India a couple of years back after a failed joint venture a decade ago. The company is relying on contract manufacturing for 200 units a year; all are being exported. In the wake of new policy developments, Enercon is looking to tap the Indian market. "We are planning to make a bigger and higher efficiency onshore machine for the Indian market by next year," says Bose of Enercon Wind Energy. Enercon hopes to earn export revenues of ₹800 crore from first year of operations.

Senvion India, formerly part of Germany's RE Power Systems SE and subsidiary of Suzlon (sold later) and now owned by Saudi Arabia-based Alfanar Group, is another WTG major working out plans for India. The company has set up a factory in Trichy for blades and nacelle at Baramati, Maharashtra. "We have ramped up capacity at all facilities to meet our annual target of one GW wind turbine production," says Amit Kansal, MD & CEO, Senvion India. It has orders from companies like Tata Power, JSW Energy, Continuum Green Energy and Fourth Partner Energy.

Chinese Envision, which established a 1,200 MW nacelle and hub assembly plant at Pune in 2018, has ramped up to over three GW, including a new blade manufacturing facility. It recently won a 350 MW order for 106 WTGs for a wind park coming up in Maharashtra. Ranked among top five WTG makers globally, Envision has an order book of over 15 GW. "Nacelles and hubs for the wind turbines (for Maharashtra) will be assembled at Pune, blades at plants in Trichy or Bengaluru while towers will be sourced from manufactures based in Maharashtra," says R.P.V. Prasad, CEO, Envision Wind Power Technologies India.

Indian conglomerates are also joining the fray. Reliance Industries' Mukesh Ambani has lined up plans to develop over 100 GW renewable energy projects in India, which will be mainly solar and wind hybrid projects. Adani Green Energy has nearly three GW wind and wind-solar hybrid projects and is entering WTG manufacturing. In November last year, Mundra Windtech, a subsidiary of Adani Enterprises, set up a 200 metres tall prototype wind turbine with a capacity to produce 5.2 MW electricity and power approximately 4,000 homes at Mundra. Mundra Windtech has already started making nacelle and hubs and will start making blades going forward, say sources.

Image : Photograph by Narendra Bisht

Hybrid Ways

Variability in output of solar and wind projects is a major hurdle to large adoption of renewables. One solution is hybridisation of wind and solar plants — making solar power during the day and wind power at night for higher capacity utilisation, reducing wheeling charges and bringing grid stability during peak hour demand. Another option is pumped storage hydro projects. India's renewable energy plans are moving in this direction, says Saurabh Kumar, vice president, Global Energy Alliance For People And Planet In India.

"When comparing levelised cost of energy (LCOE), wind is 2nd competitive renewable energy source in the range ₹2.8-3.3/kWh, 40% lower than conventional (thermal) sources of energy; this is followed by wind-solar-hybrid, with LCOE in the range of ₹2.8-3.3/kWh," says Rakesh Kalsi of TruBoard Partners.

Adani Green Energy already has the largest operational hybrid capacity in the world (over 2,140 MW). Its four wind-solar hybrid power plants are fully operational at Jaisalmer in Rajasthan. "The solar-wind hybrid infrastructure in the country is set to increase to over 9,500 MW by 2025. Hybrid models ensure more efficient use of land and transmission infrastructure and more reliability compared to standalone solar or wind projects," says Gautam Mohanka, managing director, Gautam Solar. "The country should also build an effective battery storage infrastructure and optimize its land and transmission system to leverage hybrid power projects," says Asif Khan, director, Servokon.

With that kind of momentum on both policy and industry front, winds are definitely blowing in favour of the industry in India.

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