

Utilities

Wind Energy Conference 2023: Key takeaways

Wind energy in India is on a revival path driven by the need to diversify renewables' portfolio and favourable cost economics as evidenced by wind being the largest component in 15-16GW of RE bids issued so far during 1HFY24. Given the domestic manufacturing value chain and conducive policies, the industry is confident of exceeding 4GW of annual capacity additions amidst the challenges of land acquisition, ROW and timely transmission connectivity. We attended the 2-day 5th International Wind Energy Trade Fair & Conference recently organised in Chennai and got the opportunity to hear various industry leaders, policymakers and researchers.

Key takeaways:

- In India, 15-16GW of RE bids have been issued so far during 1HFY24, with wind the largest component.
- After the expiry of the ISTS waiver in Jun'25, wind energy will become more attractive financially.
- Hybrid projects can deliver a capacity utilisation factor (CUF) of nearly 60% compared to 20-30% for standalone wind or solar projects.
- There is a growing appetite for RTC green power from emerging demand centres such as data centres, electric mobility and prospective hydrogen production units
- Solar-Wind-Storage project is increasingly becoming cost-effective with a tariff of ~INR 4-5 against INR 5-6 for coal-fired power plants.
- The average size of WTG has increased from 1.5MW in 2010 to 2.5MW in 2023. The industry is chasing higher and larger turbines. Ensuring design robustness through validation is necessary to avoid unpleasant experiences as seen in some cases in Europe.
- India may have 15-16GW of declared nameplate capacity. But, the capacity with the 'right' models is not enough.
- Global OEMs don't prefer to sell in the Indian market due to extremely competitive prices. However, Chinese players like Envision and Sany Wind Energy are building capabilities in India.
- Tamil Nadu is working on its wind repowering policy incorporating suggestions on the draft from industry stakeholders.
- Land acquisition, ROW (right of way) and transmission infrastructure remain the biggest challenges in scaling wind installation.
- India is likely to have surplus power during the morning and deficit during the evening, going forward.
- Industry opinion varied widely on the quantum and expected commissioning of wind energy projects - it ranged from 4GW to 6GW annually in the next 3-4 years.

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Wind Energy Conference 2023, Chennai

“Glory of wind is coming back” is the message from the 2-day 5th International Wind Energy Trade Fair & Conference recently organised at Chennai. We got the opportunity to hear various industry leaders (Vice Chairman/Suzlon Energy, Chairman/ Sembcorp SE, CEO/ Senvion India, CEO/ Suzlon Energy, CEO/ NTPC REL, CEO/ O2 Power, CEO/Envision India, VP/LM Wind Power), policymakers (JS/MNRE, CMD/TANGEDCO, COO/CUTUL, MD/NREDCAP) and researchers (DG/ International Solar Alliance and members from CSEP, BNEF, CEEW). Key messages from the two-day event are as follows:

The glory of wind is coming back

- Globally, 77.6GW of new wind power capacity was connected to power grids (led by China, US, Brazil, Germany, and Sweden) in 2022, bringing the total installed wind capacity to 906GW, a growth of 9% compared with 2021. By the end of 2023, the global wind capacity is likely to exceed 1TW.
- In India, 15-16GW of RE bids have been issued during 1HFY24, with wind the largest component.
- Central Electricity Regulatory Commission (CERC) has waived ISTS charges for renewable energy and pumped hydroelectric projects that will begin operations by 30th Jun'25. The waiver of these charges lowers the cost for developers, translating into attractive tariffs for businesses procuring power from ISTS-connected open access solar projects. After the expiry of the ISTS waiver in Jun'25, wind energy will become more attractive financially.

Diversity in renewables mix under focus

- Increasing the share of RE in the Indian grid is bringing new challenges to ensure grid stability. Hence, Solar Energy Corporation of India (SECI) has been experimenting with innovative procurement models (or tender designs), namely, round-the-clock (RTC), Solar-Wind Hybrid, and load-following generation pattern to procure firm or less intermittent RE.
- Some speakers thought that RTC was not a tenable concept.
- Hybrid projects can deliver a CUF of nearly 60% compared to 20-30% for standalone wind or solar projects. Also, combining hybrid with BESS (Battery Energy Storage System) can take the CUF to 80%.
- There is a growing appetite for RTC green power from emerging demand centres such as data centres, electric mobility and prospective hydrogen production units
- Considering green hydrogen, demand for RE is going to increase multi-fold.

Energy storage needs more traction

- India needs to add storage very fast, given the traction in RE capacity additions and associated challenges.
- Solar-Wind-Storage project is increasingly becoming cost-effective with a tariff of around INR 4-5 against INR 5-6 for coal-fired power plants.
- Pumped hydro storage (PSP) is emerging as a very good option for storage since it has brilliant load-following capabilities. But, it has a long gestation period.
- Non-conventional Energy Development Corporation of Andhra Pradesh Ltd (NREDCAP) has identified 42 sites for PSP projects. DPRs for 26 sites have been prepared. Out of these, 17 projects have been allocated to developers (six of them to Adani Green). Construction has begun in two projects. Generally, the construction time for these projects in 4-5 years.

Has India excess manufacturing capacity?

- The average size of WTG has increased from 1.5MW in 2010 to 2.5MW in 2023. The industry is chasing higher and larger turbines. Ensuring design robustness through validation is necessary to avoid unpleasant experiences as seen in Europe.
- Globally wind energy supply chain is highly connected. India has localised 60-70% of the supply base.
- India has achieved 80-90% localisation in the manufacture of WTG.
- India may have 15-16GW of declared nameplate capacity. But, the capacity with the 'right' models is not enough.
- Most companies in the recent decade have gone through stress. Hence, the industry is facing talent shortages.

Competition from global and Chinese players is evolving

- China meets 65% of the global WTG demand. However, India meets only 12% (around 5-6GW of exports). Global OEMs don't prefer to sell in the Indian market due to extremely competitive prices.
- Sany Wind Energy (China) is building capabilities in India. Recently, it has set up an O&M division. Currently, it is executing a 4MW WTG for Sembcorp. The company also intends to start manufacturing in India from its existing construction machinery manufacturing facility in Pune.
- Envision has 5GW of orders from the Indian market. It has also set up a 3GW manufacturing facility with 50-60% localisation.

Repowering is work-in-progress

- Current MNRE policy on repowering doesn't address investors' concerns. Ownership of old wind farms is highly fragmented. WTGs that were installed before 2017 have FiTs along with many other incentives including banking.
- All wind turbines that have CUFs less than 15% are technically ready for repowering, according to the NIWE. Their CUF can be doubled or, at wind-intensive sites, tripled. The capacity could be increased by 3-4 times.
- As a result, the estimated generation at a repowered site could be 4-12 times higher. To accommodate future technology, NIWE estimated India's wind energy potential to be 150m hub height.
- Modern wind turbines have a plant load factor (PLF) of 30-35%. If repowered, the project capacity and PLF of the turbines can go up 2-3 times and this can translate into at least fivefold increase in annual energy production.
- For example, a group of old wind farms in Tirunelveli, Tamil Nadu, with a wind power generation capacity of 1,080MW generates 2,300MU of electricity. When they are repowered with higher ratings and height and better technology they can have an installed base of 1,800MW and generate 6,500MU of electricity.
- Tamil Nadu is working on its wind repowering policy incorporating suggestions on the draft from industry stakeholders. In the repowering policy, the state government is trying to address some challenges as large development of wind capacity may result in loss of captive status for some of the industrial units. As of now, the incentives available in the repowering policy are not adequate or attractive enough to force windmill players with low capacity of 0.25MW to 1MW per windmill to opt for higher size windmills. All wind turbines that have CUFs less than 15% are technically ready for repowering. Their CUF

can be doubled or, at wind-intensive sites, tripled. The repowering initiative can help Tamil Nadu to significantly increase its wind power capacity by 3-4 times.

Tamil Nadu (TN) aims to regain numero-uno position

- For the first time, Gujarat has overtaken TN in wind energy. As of 31st Aug'23, Gujarat's installed capacity in wind energy stood at 11,063MW while TN was 10,248MW.
- The 53% of installed power generation capacity in TN is from renewable energy, including hydropower. Wind power constitutes 84% of the state's renewable energy potential followed by solar (14%).
- TN contributes to almost 1/4th of India's installed wind power capacity.
- TN has the unique advantage of getting wind power on RTC (round-the-clock) basis for 4 months when it can ramp down some coal plants and inject more green power into the grid. TANGEDCO is also working on programmes that will incentivise solar power to provide power on an RTC basis for the remaining 8 months.
- TN followed a unique model in wind energy development. In other states, large wind farms account for the bulk of the capacity whereas in TN about 65% of the wind energy capacity (about 8,000MW) is owned by individual industrial units or small companies for captive consumption.

Risks to the growth story

- Land acquisition and ROW remain the biggest challenges in scaling wind installation. However, there are land aggregators who are helping developers with new projects (out of the 13 SECI bids, only 4-5 projects are completed in time).
- Transmission infrastructure for power evacuation is also a challenge; but the government's initiative to build a green corridor is reassuring.
- The Indian market is very cost-conscious. Obsession with low tariffs is damaging the industry. SECI conducted India's first auction of 1,000MW ISTS wind power projects in Feb'17 in which a tariff of INR 3.46 was discovered, which was much lower than feed-in tariffs in vogue those days. Since then average tariff has further come down to INR 3.2 while input cost has increased significantly.
- RE requires constant innovations. Hence, India needs to scale investment in R&D, which is currently lacking.

Titbits

- Currently, the life of WTG is generally 20 years. However, as height increases turbulence reduces, which is likely to increase life to 35 years.
- Sanghvi Movers is seeing a lot of demand for EPC works from wind energy developers. It commands 65-70% market share in the supply of cranes to India's wind energy market.
- India is likely to have surplus power during the morning and deficit during the evening, going forward. Hence, merchant power tariff is increasing in the evening.
- There were varied opinions in industry on the expected commissioning of wind energy projects; the expectations ranged from 4GW to 6GW annually in the next 3-4 years.

Exhibit 1. Glimpses of the Wind Energy Conference 2023



Source: Conference, JM Financial

APPENDIX I

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