Equity Research

June 29, 2023

BSE Sensex: 63915

ICICI Securities Limited is the author and distributor of this report

Initiating coverage

Utilities

Target price Rs22

Shareholding pattern

	Sep '22	Dec '22	Mar '23
Promoters	14.5	14.5	14.5
Institutional investors	16.2	13.5	13.2
MFs and others	0.1	0.2	0.1
FI/Banks	8.2	5.6	5.5
FIIs	7.9	7.7	7.6
Others	69.3	72.0	72.3

Source: NSE

ESG disclosure score

Year	2020	2021	Chg
ESG score	**NA**	**NA**	**NA**
Environment	NA	NA	NA
Social	NA	NA	NA
Governance	NA	NA	

Note - Score ranges from 0 - 100 with a higher score indicating higher ESG disclosures.
Source: Bloomberg, I-Sec research

Research Analysts:

Mohit Kumar
kumar.mohit@icicisecurities.com
+ 91 22 6807 7419

Ashwani Sharma
sharma.ashwani@icicisecurities.com
+ 91 22 6807 7340

Nikhil Abhyankar
nikhil.abhyankar@icicisecurities.com
+91 22 6807 7230

Bharat Kumar Jain
jain.bharat@icicisecurities.com
+91 22 6807 7397

INDIA

Suzlon Energy

BUY

Winds of change

Rs15

"The future's in the air, I can feel it everywhere, Blowing with the wind of change"

– Scorpions.

The Indian power grid needs more wind in its mix. The need to enhance wind capacity addition (post subdued activity in the recent past) has finally dawned upon the stakeholders. Grids are looking for a solution to meet demand effectively while containing carbon emissions. The supply of renewables can be increased by setting up a mix of wind, solar and battery storage capacities. Optimal solutions for the grid to meet demand by using renewables includes higher wind in the mix (of ~8GW per annum) led by the complementary nature of generation and cost curves of the wind. As a result, India has launched series of policy initiatives: 1) single-stage closed bidding (vs reverse e-auction), 2) 10GW of wind auction per annum, and 3) wind-specific RPOs etc. These policies are likely to generate tailwinds for the industry and, we believe, Suzlon Energy (Suzlon), the market leader, is best suited to reap the benefits of the same. Also, the 'net debt / EBITDA' ratio on Suzlon's balance sheet has declined to ~1x (from ~10x in FY22). Initiate with BUY.

- **A slew of policy actions:** India has amended the wind energy policy, which adversely impacted capacity addition between FY17-FY23. It has discontinued with reverse e-auctions, introduced wind-specific RPOs, and its plans to auction 10GW per annum. Also, the repowering policy is under works.
- **It's not either wind or solar; wind has its place:** The lowest-cost solution for an optimal decarbonised grid is a mix of wind, solar and battery storage capacities. Wind generates power in monsoon and nights when solar generation is low. Also, we believe higher wind will lead to lower battery storage requirement for a decarbonised grid.
- **Sharp improvement in industry outlook; we estimate market growth at 35% CAGR:** On the back of various policy actions, industrial demand and more round-the-clock contracts, we believe the wind industry is finally set to turn the corner. We are baking-in 3.5GW and 4.5GW for FY24E/FY25E (*vs* 2.2GW in FY23).
- **Suzlon – market leader by wide margin:** Suzlon has enjoyed a market share of 33% in India's domestic market (based on total installations) (source: company). It has 20GW of operational wind power capacity globally and is well ahead of its competitors. Note that its existing orderbook at 1.5GW bodes well for execution through the next 2 years.
- **A repaired balance sheet; leverage is relic of past:** Suzlon has reduced leverage by restructuring its debt and by raising money through a rights issue. As a result, leverage is now merely 1x debt/EBITDA. Thus, the company has got all the right ingredients to benefit from industry tailwinds, in our view.
- **Initiate with BUY:** We believe Suzlon is best equipped to benefit from industry tailwinds. We expect a sharp uptick in earnings FY24E onwards. Initiate with **BUY** and a target price of Rs22 per share (assigning a multiple of 24x FY25E EPS).

Market Cap	Rs190bn/US$2.3bn
Reuters/Bloomberg	SUZL.BO / SUEL IN
Shares Outstanding (mn)	12,405.9
52-week Range (Rs)	15/6
Free Float (%)	85.5
FII (%)	7.6
Daily Volume (US$/'000)	20,756
Absolute Return 3m (%)	109.2
Absolute Return 12m (%)	127.9
Sensex Return 3m (%)	11.6
Sensex Return 12m (%)	21.7

Year to Mar	FY22	FY23	FY24E	FY25E
Revenue (Rs bn)	65.8	59.7	77.5	111.6
EBITDA (Rs bn)	8.9	8.3	10.6	15.5
Adjusted NI (Rs bn)	-2.8	1.7	5.8	11.2
DEPS (Rs)	(0.3)	0.1	0.5	0.9
% Chg YoY	(65.1)	(146.9)	243.4	93.0
P/E (x)	(51.0)	108.8	31.7	16.4
CEPS (Rs)	(0.3)	0.1	0.5	0.9
EV/E (x)	28.2	24.0	18.5	12.4
RoCE (%)	16.9	19.1	25.2	31.3
RoE (%)	7.9	15.1	34.6	40.0

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Outlook and valuation

Suzlon Energy (Suzlon) is getting back into shape after a 'rollercoaster' journey over the last decade due to a slump in industry volumes and high leverage led by acquisition of Repower in 2008. However, after a series of debt restructuring, net debt has declined sharply from Rs130bn in FY20 to Rs12bn as of Mar'23. In addition, the industry is looking at a revival led by a slew of policy actions.

Company has been investing in R&D and has kept pace with innovations in Indian markets. It recently launched a 3MW turbine with increased rotor diameter and hub height, keeping in line with the product launches from other global wind OEMs in the Indian markets. As of May'23, Suzlon has already booked 750MW worth of orders for the newly launched 3MW turbine.

Moreover, major positive changes on the regulatory, policy and eventually business front bode well for prospects of the wind industry. The government has decided to tender out at least 10GW of wind capacity every year with pickup in demand from commercial and industrial entities for round-the-clock power supply. Suzlon, being the market leader in the wind turbine industry, is the natural beneficiary of this shift, in our view.

Suzlon reported its first adjusted PAT – of Rs1.7bn – in FY23 after FY10 (barring FY17). It has also amassed orders worth 1.5GW as of May'23 and expects execution to pick up from FY24. We expect Suzlon to execute wind capacity worth 900MW/1400MW in FY24E / FY25E respectively.

We expect a revenue CAGR of 37% to ~Rs112bn over FY23-FY25E, EBITDA CAGR of 37% to ~Rs16bn with an EBITDA margin of 14%, and PAT at ~Rs11bn in FY25E. We initiate coverage on the stock with a **BUY** recommendation. Our P/E based target price is **Rs22,** valuing the business at 24x FY25E EPS of Rs0.9/share. We assign a multiple of 24x (vs capital goods coverage universe average of 31x FY25E) based on strong rebound in earnings and strong industry outlook.

Table 1: P/E based target price

	FY25E PAT (Rs mn)	Multiple (x)	FY25E Equity value (Rs mn)	Value per share (Rs)
Valuation	11,215	24	2,69,156	22
Equity Value			**2,69,156**	**22**

Source: I-Sec research

Table 2: Peer valuation in the wind equipment space

	EV/EBITDA			P/E			RoE (%)		
	FY23	**FY24E**	**FY25E**	**FY23**	**FY24E**	**FY25E**	**FY23**	**FY24E**	**FY25E**
Suzlon	22.8	17.6	11.8	108.8	31.7	16.4	15.1	34.6	40.0
Inox Wind	NA	NA	NA	-12.7	NA	NA	-37.4	NA	NA
	CY22	**CY23E**	**CY24E**	**CY22**	**CY23E**	**CY24E**	**CY22**	**CY23E**	**CY24E**
Vestas	-24.0	12.2	9.2	NM	30.4	19.0	21.4	27.5	24.7
Nordex	NM	9.5	5.8	NA	NM	16.9	2.1	14.0	19.0
Siemens Gamesa	NA	NA	NA	NA	NA	NA	-3.8	8.1	10.8
Goldwind	12.5	10.7	9.9	7.4	6.2	5.6	7.7	7.9	NA

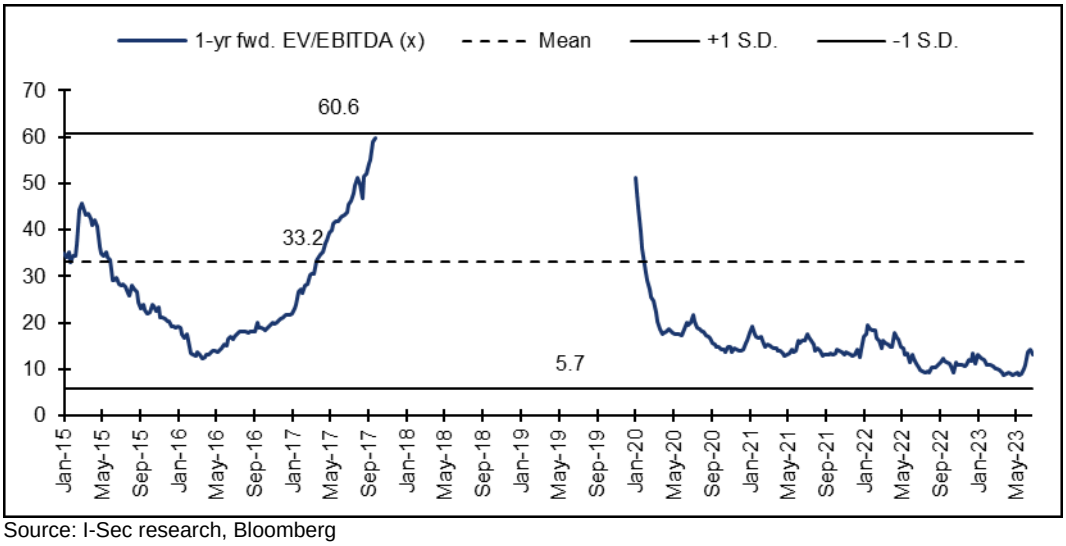
Source: I-Sec research, Bloomberg
NA = Not Available; NM = Not Meaningful

Table 3: Valuations of other capital goods companies

	EV/EBITDA (x)			P/E (x)			RoE (%)		
	FY23	FY24E	FY25E	FY23	FY24E	FY25E	FY23	FY24E	FY25E
Larsen & Toubro Ltd	2.7	18.3	16.0	2.4	27.6	23.0	164.2	13.0	14.2
ABB India Ltd	78.2	60.9	51.3	117.7	91.5	77.7	15.6	17.1	17.1
Cummins India Ltd	37.0	30.9	24.8	45.5	39.0	32.1	22.3	23.1	24.1
KEC International Ltd	20.5	11.5	8.9	37.8	99.4	15.0	3.8	14.8	18.6
Thermax Ltd	44.4	35.5	30.5	84.7	58.7	41.2	12.4	14.0	14.3

Source: I-Sec research

Chart 1: 1-year forward EV/EBITDA valuation chart



Source: I-Sec research, Bloomberg

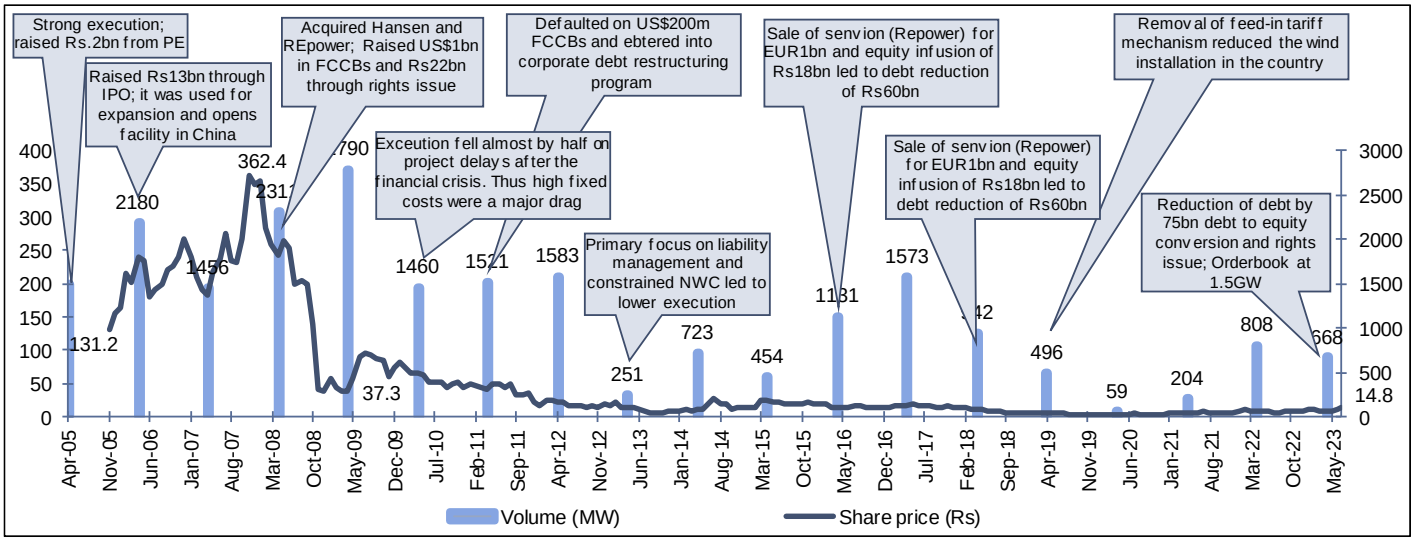
Investment rationale

- Indian wind market is set to witness a CAGR of 50% over the next few years aided by a number of policy actions favouring new wind capacity additions. We expect wind capacity additions to improve to 3.5GW and 4.5GW in FY24E and FY25E, respectively.
- Wind market declined from 5.5GW in FY17 to 1.2GW in FY18 – an unintended outcome of a change from feed-in-tariff (FiT) scheme to the reverse auction bidding scheme in 2017.
- Amongst a recently announced set of policy actions, the notable ones are: a) to conduct a bid of 10GW of wind annually (we expect 5-6GW of tendering per year), b) step-up in specific wind renewable purchase obligations, c) ensuring that capacity addition is well diversified across wind resources rich states, and d) closed envelope bidding (*vs* e-auctions).
- A decarbonised world needs a solution for round-the-clock supply through renewables. Wind, with its different generation profile compared to solar, adds to the diversity of generation and will likely lead to lower costs for the grid, in our view. In short, the grid needs both – wind and solar. As a result, India's apex planning body wants to add 8GW per annum.
- Suzlon Energy (Suzlon) has remained a leader by far in Indian wind industry with 15GW of cumulative wind installations accounting for a market share of 33%. It has installed a cumulative 20GW across the world.
- Suzlon repaired its balance sheet in FY23 through: a) conversion of debt into equity, and b) raising money through a rights issue. The balance sheet was marred by legacy debt taken for acquisitions and was also impacted by two major downturns in the industry. The new Suzlon has a 'net debt to EBITDA' of <1x in FY24E.
- Orderbook has improved to 1.5GW, a very healthy 2x book to bill ratio. The order book is close to the highest it has achieved in the domestic industry.
- We are baking-in sale of 900MW and 1,400MW execution in FY24E and FY25E, respectively, aided by strong orderbook and improving industry outlook. Suzlon is also doing operation & maintenance for 1.7GW yielding revenues and EBITDA of Rs18bn and Rs7bn, respectively.
- Revenues are expected to register a 37% CAGR during FY23-FY25E. Also, we estimate 4% CAGR in the company's operations and maintenance services over FY23-FY25E. Thus, EBITDA CAGR is likely at 37% in the same period.
- Following the above, we expect Suzlon to report an EPS of Rs0.9 per share. We arrive at a target price of Rs22 per share (multiple of 24x FY25E EPS). Initiate with **BUY**.

Suzlon – a historical overview through ebbs and flows

Suzlon has become synonymous with Indian wind turbine industry. Its journey from a small captive wind business to become the leading player in wind industry in India has been exemplary. Along the way, it has suffered setbacks – some of its own making and some of due to external environment. In short, the international acquisitions through leverage amidst consequent decline in global wind installations led to losses for the company. However, after two bouts of restructuring and exit from global markets, leverage is at 1x FY24E net debt/EBITDA while the improving domestic industry outlook bodes well for the company.

Chart 2: Historical stock price trend and major events in Suzlon



Source: I-Sec research, Bloomberg

What went wrong and how Suzlon is bouncing back

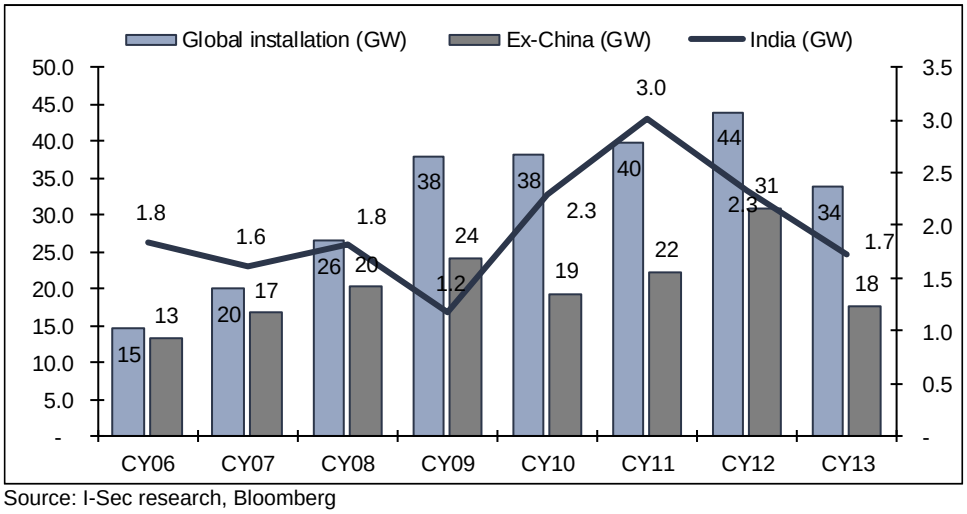
FY03-FY08 – on steroids (raised money, grew capacities and acquired companies)

- Suzlon ventured into the wind market by acquiring Sudwind Energy GmbH, a German company.
- It raised Rs14bn through an IPO in FY06 for expansion of manufacturing facilities in India, capital infusion into subsidiaries and working capital requirements.
- It entered the US and Chinese markets, acquired Hansen Transmissions and Senvion, and signed a large contract with Edison Mission Energy.
- Suzlon acquired Senvion (RE Power at the time), a German wind turbine manufacturing company for EUR1.4bn in 2007 to gain additional technical expertise and establish a presence in Europe.
- Suzlon acquired Hansen Transmissions, a Belgian gearbox and drive train manufacturer, in 2006 for EUR465mn. Suzlon made this acquisition to integrate gearbox technology into its wind turbine solutions.
    - Both the above acquisitions were funded with debt leading to debt increasing from Rs2.4bn in FY04 to Rs100bn in FY08.

FY08-FY13 – Hit by global financial crisis

- Global market (ex- China) saw a decline in installations from 24GW in CY09 to 18GW in CY13 due to the global financial crisis after a lag as new project additions declined. Indian domestic installations too slowed down till CY13 to 1.7GW from a high of 3GW in CY11.
- Suzlon's execution too declined from 2.8GW in FY09 to 1.4GW in FY10 and EBITDA fell from Rs28bn to Rs8bn. As a result, it started making losses.
- Suzlon had raised huge debt in order to expand capacity and for acquisitions in Europe, US and Australia. This led debt to spike from Rs2.4bn in FY04 to Rs150bn in FY09.
- It had also raised US$500m through foreign currency convertible bonds (FCCBs) for foreign acquisitions. However, after the financial crisis, as execution slowed, it could not meet its debt obligations in time.
- Suzlon defaulted on its FCCB loans in FY13 and approached the corporate debt restructuring (CDR) committee for restructuring its debt. It had its FCCB debt restructured via an extension in repayment period with a reduction in the conversion price.
- Also, Suzlon received support from its domestic lenders and shareholders, who agreed to extend the repayment period and converted part of their debt into equity.
- However, as execution slowed on project cancellation and deferrals, working capital requirement kept increasing and the company kept making operational losses till FY14.

Chart 3: Global installation growth (ex-China) remained subdued post financial crisis



Source: I-Sec research, Bloomberg

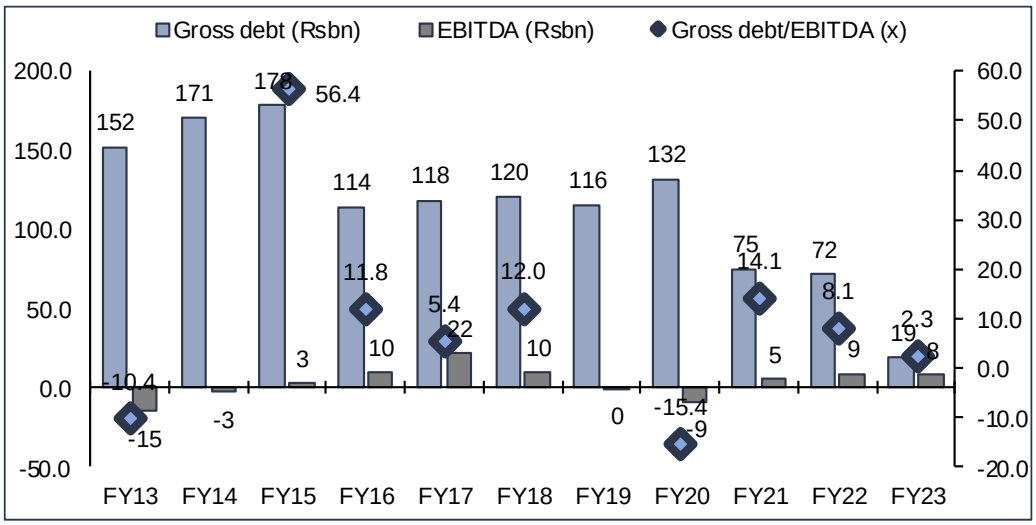
FY15-FY17 – sharp recovery in domestic market led by exit from global markets

- Suzlon raised funds (Rs18bn) from one of the financial investors, sold its stake in Senvion (Repower) and also divested some of its non-core assets.
- It sold its remaining subsidiary, Senvion SE, to Centerbridge Partners, a private equity firm, for Rs.72bn. This deal helped Suzlon pay off some of its debt and free up some cash for its operations.
- This led to a sharp reduction in debt from Rs180bn in FY15 to Rs.114bn in FY16, thus reducing the finance cost from Rs20bn in FY15 to Rs12bn in FY16.
- Suzlon exited REPower and started focusing on its core markets of India. Domestic market had also started to look up after a lull witnessed from FY11-FY14. Domestic wind installation increased to 4.1GW in FY17 (up 2x) as compared to 2GW in FY14.
- Suzlon launched its S111 series of wind turbines, which had a rotor diameter of 111m and a rated capacity of 2.1MW. These turbines were designed for low wind speed sites and offered higher energy output and lower cost of energy.
- Suzlon also introduced its lattice-tubular tower technology, which enabled higher tower heights of 120m and 140m for its S111 turbines.
- Suzlon's efforts paid off, as it achieved a record installation of 1,779 MW in 2017, capturing a greater market share. As a result, it reported an EBITDA of Rs22bn and profit of Rs5.6bn in FY17.

FY18-FY23 – a subdued domestic wind market

- In a sudden shift away from feed-in tariff regime for wind projects, India shifted to e-reverse bidding mechanism wherein a developer had to bid the cost at which it would supply power from the project.
- The developers bid irrationally in the auction. As a result, the projects didn't take off. This led to a sharp drop from 5.5GW wind installation achieved in FY17 to 2.2GW in FY18 and further to 1.1GW in FY20.
- Suzlon continued to report losses between FY18 and FY22 due to wind market slowdown and elevated debt levels.
- As a result, the company had to undergo a second debt restructuring. It reduced its debt from Rs130bn in FY20 to Rs19bn in FY23 while converting most of this debt into equity. It also raised Rs12bn through a rights issue.
- Thus the gross debt as of Mar'23 stands at Rs19bn and 'debt to EBITDA' returned to healthy levels of 2.3x in FY23. We believe this is likely to further reduce the cost of finance going forward.
- Suzlon has also plans to sell a few of its non-core assets (corporate office & land in Pune and subsidiary SE Forge) under debt restructuring. Also, it has a strong OMS portfolio, which can be liquidated to raise cash in the future.
- During the troubled times, it has continued to innovate and has launched new products of 3MW series with a hybrid lattice tubular tower.

Chart 4: Suzlon – a chequered history due to high leverage



Source: Company, I-Sec research

Hordes of positive action by policy makers

- **A series of steps have been taken by policy makers to reverse earlier policies that hampered wind capacity addition between FY18-FY23.**
- **Policy makers decided to do away with reverse auctions. We believe reverse auctions are not suited for wind installation as projects are complex.**
- **Under the new bids, the wind power purchase agreements will be based on a single stage two envelope closed bidding. Note that introduction of e-auctions had led to decline in wind capacity addition.**
- **Moreover, the apex electricity planning authority has advocated 8GW of capacity addition per annum and Indian government has directed to do the bids of 10GW of wind per annum between FY24-FY28 and 40GW bids for solar and hybrid bids (hybrid will require additional wind capacity)**
- **The bids have to be done with a state-wise cap of 2GW per annum. This is expected to reduce the pressure on land acquisition and transmission evacuation. This will ensure that wind capacity addition is well diversified, thus aiding the grid.**
- **Also, the cost of wind power from across the states will be pooled together and passed on to the procuring discoms. This will encourage wind developers to look at projects in non-wind states too.**
- **Transmission charges for renewable assets are nil if commissioned before 2025.**
- **The India government has also come out with ambitious wind-specific renewable purchase obligations – in sync with overall target to reach 500GW by 2030.**
- **Government is encouraging round-the-clock renewables capacity, which will entail wind plus solar plus storage. Note that 33% of the auctions in FY23 was round-the-clock.**
- **Repowering is under the government's active consideration. Government has come out with a draft policy for replacing existing older turbines with new turbines. In our view, this could aid in increasing the market size for wind turbines.**

Wind energy addition in India took a backseat post the introduction of reverse e-auctions. Capacity addition declined from 5.5GW to 1.5GW in FY18 and has since been stuck in the slow lane.

With a total installed wind capacity of 43GW, India ranks among the top countries in the world for wind energy development. The country has an ambitious plan to reach 100GW of wind power by 2030 and 140-150GW by 2030 as part of its renewable energy programme.

To revive the wind sector, Indian policy makers have taken three steps:

- Removing the reverse e-auction mechanism and resorting to single staged closed bidding – composite bids comprising state specific sub bids for all 8 windy states
- Introducing wind-specific renewable purchase obligations (RPOs)
- Planning to auction 10GW of wind power projects per annum

No reverse auction; closed envelope bidding

India chose to do reverse e-auctions for wind energy in 2017 – replacing the existing feed-in tariff mechanism (fixed tariff for 25 years). The reverse e-auction is a process where the bidders can compete online in real time. However, the wind capacities didn't materialise due to irrational assumptions by the bidders – on evacuation and land acquisition for the most suitable sites.

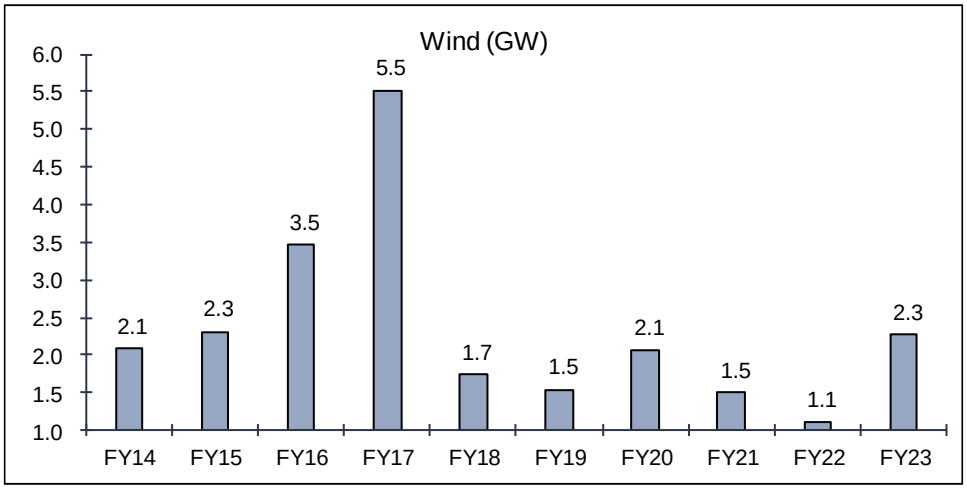
We believe that wind is not suitable for e-auction because of complexity and inherent variability of the projects.

Note that the reverse e-auction mechanism faced challenges, such as:

- Low tariffs affecting the profitability and sustainability of the developers
- Cancellation of bids due to non-compliance with ceiling tariffs or lack of demand from discoms
- Developers rushed to select sites in a few high wind potential states leading to pressure on land and evacuation infrastructure
- Delays in signing power purchase agreements (PPAs) due to disputes over tariffs or land availability
- Lack of clarity on land and transmission availability and allocation
- Disincentivising innovation and quality improvement in technology and services

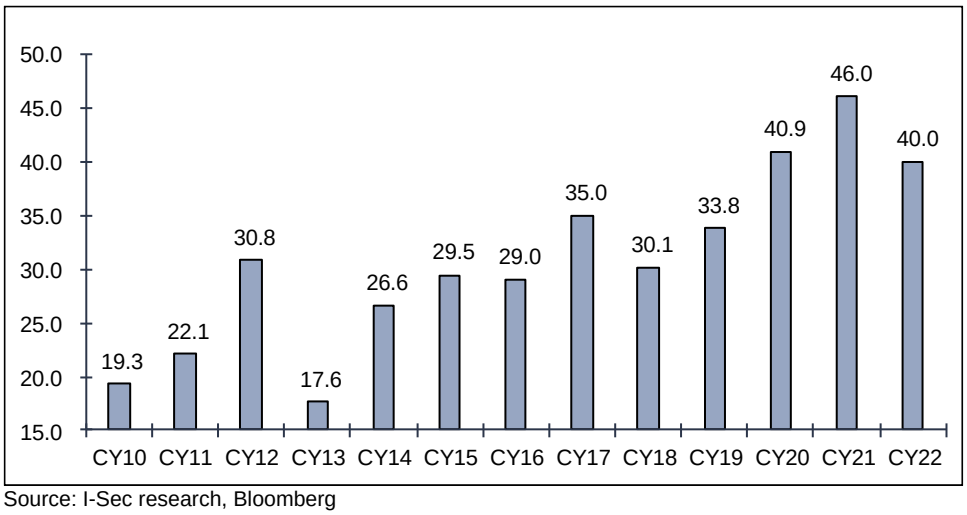
This is evident in the charts below. Capacity addition was at a high in FY17, but introduction of the new mechanism led to decline in industry volumes.

Chart 5: Annual capacity addition in India (GW)



Source: I-Sec research, Bloomberg

Chart 6: Annual capacity addition globally ex-China (GW)



Source: I-Sec research, Bloomberg

The government decided against reverse bidding for wind energy projects in Jan'23. It also said it would issue tenders inviting bids for 10GW of wind power projects every year until 2030.

Introduction of closed envelope bidding

The new bidding mechanism will be based on a single-stage 'two envelopes' basis, where bidders will submit both technical and financial bids simultaneously. The technical bids will be opened first and evaluated for eligibility criteria. The financial bids will be opened only for those bidders who qualify in the technical evaluation. The bidder who quotes the lowest tariff will be declared as the successful bidder. The cumulative capacity in any of the eight states will not be more than 2GW. Power from each state bids will be pooled and offered to DISCOM on a single tariff under power supply agreements. The new bidding mechanism is expected to have several advantages over the reverse e-auction process, such as:

- Ensuring viable, fair and transparent price discovery based on market demand and supply
- State-wise bidding will be published in advance, which will provide certainty and stability to the developers and investors
- Encouraging innovation and quality improvement in technology and services
- Reducing disputes and delays in signing PPAs
- Optimising land and transmission utilisation across states
- Wind projects can come up in all the eight states, ensuring faster execution and even uniform growth

Pooled wind power from various states to be passed on at blended cost under the PPAs

After the removal of feed-in tariff mechanism in 2017, wind power installation in the central part of India almost dropped to nil as most of the wind developers flocked to coastal states to set up incremental wind capacities. However, higher concentration of

wind capacities in these states resulted in various difficulties such as land acquisition, general depletion of windy sites, etc.

Nevertheless, under the new mechanism, wind project auctions will be bundled together. Multiple wind projects across various states and PPAs will be signed with the discoms on blended cost of the power across all the projects. This is likely to lead to an even spread of wind power projects across the country.

Table 4: Solar Energy Corporation of India (SECI) tranche -15

States	Capacity to be awarded (MW)	Designated delivery
Tamil Nadu	300	Karur
Karnataka	1200	Koppal, Bidar, Bijapur, Devangir, etc.
Telangana	400	Nizamabad, Medhak, Rangareddy
Andhra Pradesh	300	Kurnool, Ananthpur
Maharashtra	300	Solapur, Dhule, Parli
Total	**2500**	

Source: SECI, I-Sec research

Similar projects are already being taken up by the SECI. Under the SECI tranche 15 tender, the corporation will auction 2.5GW of wind capacity with projects spread across 5 states. The power produced across all these projects will be pooled together and will be sold to discoms at a pooled price.

Tamil Nadu is a wind-rich state compared to Maharashtra, thus cost for generating wind power in Tamil Nadu will be far cheaper than in Maharashtra. Thus, no discom would have been willing to sign PPAs with Maharashtra-based projects owing to higher cost. However, when we combine the two projects, the blended cost is likely to remain cheap.

Table 5: Tariff estimates to generate 15% IRR for individual and combined projects

State	Capacity (MW)	Capital cost (Rs bn)	Equity (Rs bn)	PLF (%)	Generation (BU)	Tariff for 15% IRR
Tamil Nadu	300	21	6.3	40%	1.05	2.3
Karnataka	1200	84	25.2	35%	3.68	2.6
Telangana	400	28	8.4	30%	1.05	3
Andhra Pradesh	300	21	6.3	28%	0.74	3.2
Maharashtra	300	21	6.3	25%	0.66	3.6
Total	**2500**	**175**	**52.5**	**32.8%**	**7.17**	**2.8**

Source: I-Sec research

If the project in Parli is not combined with other projects, it is unlikely to get demand from discoms owing to higher cost. However, combining it with other projects will bring the blended cost down to Rs2.8/unit. Thus this process is likely to make projects in comparatively less non-windy locations economically viable and enable higher capacity addition going forward.

Specific RPO for wind

By having a dedicated RPO for wind, the government can provide a stable and supportive policy environment for the growth of wind energy projects in India. This can help overcome some of the hurdles that the wind sector faces, such as securing land, connecting to the grid, building transmission lines, and setting fair tariffs.

A separate RPO for wind can also ensure fair competition for the wind sector and attract more investments and innovations in this domain. This can help achieve the national goal of 500GW of renewable energy by 2030, of which 100GW is projected to come from wind energy (currently at 43GW).

Suzlon, as one of the leading wind energy companies in India, can also potentially benefit from a specific RPO for wind. It can help the company expand its market share, order-book and profitability. It can also enable Suzlon to use its expertise and experience in offering comprehensive solutions for wind energy projects.

The Ministry of Power has introduced a specific renewable purchase obligation (RPO) for the entire country based on the source of generation. Thus, based on this policy, India has set a target to source 7% of its power consumption from wind energy by 2030.

Table 6: India RPOs targets by 2030

Year	Wind RPO	Hydro RPO	Other RPO	Total RPO
FY23	0.8%	0.4%	23.4%	24.6%
FY24	1.6%	0.7%	24.8%	27.1%
FY25	2.5%	1.1%	26.4%	29.9%
FY26	3.4%	1.5%	28.2%	33.0%
FY27	4.3%	1.8%	29.9%	36.0%
FY28	5.2%	2.2%	31.4%	38.8%
FY29	6.2%	2.5%	32.7%	41.4%
FY30	6.9%	2.8%	33.6%	43.3%

Source: I-Sec research

If we consider a base demand CAGR of 7% till 2030, India will require to source around 225BU of wind power by 2030 – and India produced 70BU of wind energy in FY23 from a 42GW capacity. Thus, the country will require around 75-80GW of additional wind capacity by 2030 to meet the RPO target.

Wind-specific auctions picking up again

A series of auctions were conducted by government between FY17-FY19 though capacity addition was muted on account of the various reasons discussed earlier. The central agencies are likely to step up wind auctions. FY23 saw wind-specific auctions of 3.4GW (*vs* 1.2GW in FY22). Further, a tender of 1.2GW was concluded in May'23 and another of 2.5GW is under bidding process.

Table 7: Domestic wind-specific auctions

Tenders	Date of Award	Capacity awarded (MW)	Net capacity (MW)	Commissioned (MW)	Yet to commission (MW)	Agency	Tariff (Rs/unit)
SECI-I	Feb-17	1,050	1,000	1,000	-	Central	3.46
SECI-II	Oct-17	1,000	980	760	220	Central	2.64
Tamil Nadu	May-17	450	450	50	401	State	3.42
Gujarat (GUVNL)	Jun-17	500	470	470	-	State	2.43
SECI-III	Feb-18	2,000	2,000	950	1,050	Central	2.44
Maharashtra (MSEDCL)	Mar-18	500	500	274	226	State	2.85
SECI-IV	Apr-18	2,000	2,000	722	1,278	Central	2.51
NTPC	Aug-18	1,150	-	-	-	Central	2.77
SECI-V	Sept-18	1,190	1,190	257	934	Central	2.76
SECI – VI	Dec-18	1,200	1,075	916	159	Central	2.82
SECI – VII	May-19	480	480	118	362	Central	2.79
GUVNL Ph.-II	May-19	203	203	163	40	State	2.8
SECI – VIII	Aug-19	440	440	-	440	Central	2.83
SECI IX	Aug-20	970	970	-	970	Central	2.99
SECI X	Mar-21	1,200	1,200	27	1,173	Central	2.77
SECI XI	Sept-21	1,200	1,200	-	1,200	Central	2.69
SECI XII	Jun-22	1,200	1,100	-	1,100	Central	2.89
GUVNL Ph.-III	Sept-22	1,000	1,000	-	1,000	State	2.84
SECI XIII	Dec-22	1,200	1,200	-	1,200	Central	2.9
SECI XIV	Apr-23	1,240	1,240	-	1,240	Central	3.2
SECI XV	May-23			**Yet to be auctioned**			
Total		**22,673**	**18,698**	**5,707**	**12,991**		

Source: SECI, I-Sec research

Stepping up the renewables auction trajectory – Wind at 10GW

India is looking to auction of 50GW of renewables per year in next five years. Of this, it has directed to do 10GW of bids for wind-specific renewables while the balance 40GW is likely to be solar, solar-wind hybrid, round-the-clock renewable energy power, etc.

Note that the government has also set monthly and quarterly targets for renewable capacity auctions for FY24 by NTPC, SECI, NHPC and SJVN, the renewable energy implementing agencies. Government has directed to bid 50GW of renewable capacity in FY24 of which 10GW is expected to be wind. While NTPC and SECI are mandated to auction 12.5GW of solar/hybrid and 2.5GW of wind each, NHPC and SJVN have been given targets to auction off 7.5GW of solar/hybrid and 2.5GW of wind each in FY24.

Table 8: Renewable capacity tendering timeline for government agencies; wind at 10GW

Agency	Type	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Total (GW)	
SECI	Solar, Hybrid, etc.	2		1.5	3		3	2			1			12.5	15
	Wind		2.5											2.5	
NTPC	Solar, Hybrid, etc.		3			3			3			3.5		12.5	15
	Wind				2.5									2.5	
NHPC	Solar, Hybrid, etc.			3			1.5			1.5			1.5	7.5	10
	Wind									2.5				2.5	
SJVN	Solar, Hybrid, etc.		3			2			1		1.5			7.5	10
	Wind												2.5	2.5	

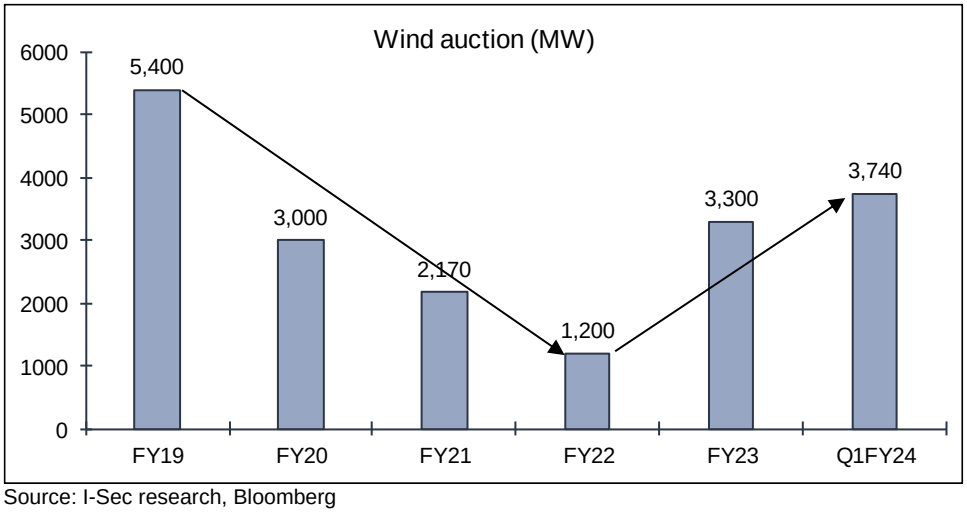
Source: I-Sec research

SECI has already floated 2.5GW of wind tenders in May'23 and 2GW of solar in Apr'23; SJVN is yet to float a tender for its 3GW solar project.

However, note that apart from 10GW of wind, tender for 40GW consists of solar and hybrid capacity. Hybrid tender will entail the addition of wind capacities. As a result, the plan of 50GW auction could translate into ~15GW of wind capacity auction.

India's wind capacity addition slowed significantly after the removal of feed-in tariff mechanism and then subsequently the wind auction fell as well. The wind auction fell to 1.2GW in FY22. However, after the recent policy changes, wind auctions have picked up and touched 3.3GW in FY23 and in Q1FY24 it has surpassed to 3.7GW.

Chart 7: Wind capacity awarding activity has picked up in recent times



Source: I-Sec research, Bloomberg

Hybrid tenders are picking up – increases market size of wind energy

Grid is floating new tenders increasingly with hybrid requirements. FY23 witnessed 2.5GW of hybrid tenders or 30% of total tenders. FY24 has also started well with conclusion of 1.5GW in last two months. We estimate FY23 tenders will need an additional 1GW of wind turbines for execution.

As a result, we expect wind capacity to benefit from hybrid tenders. Note that requirement of wind turbines in a particular hybrid tender will depend on the specification and requirement of the tenders.

Table 9: Hybrid capacity tendering and awarding

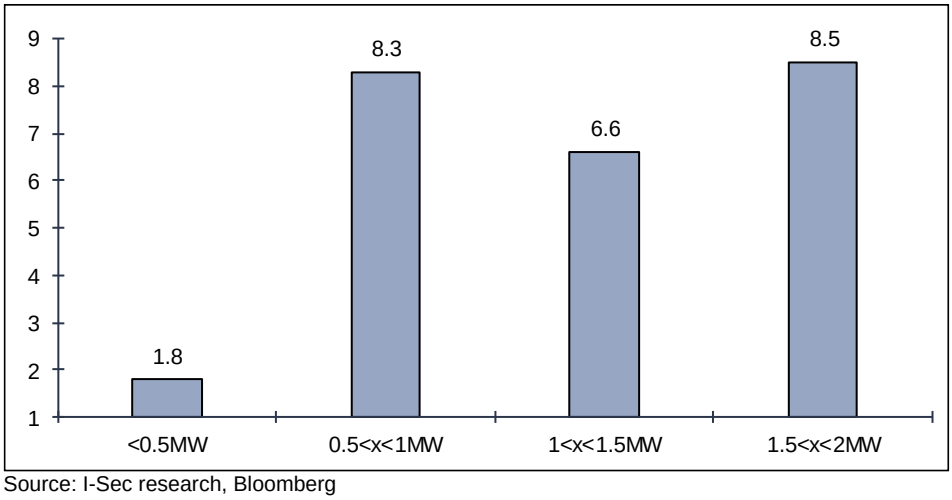
Bid	Capacity awarded (MW)	Date	Commissioned (MW)	Tariff (Rs/unit)
SECI Hybrid - I	1,050	Jun-18	840	3
SECI Hybrid - II	600	May-19	600	3
AMEL	700	Jan-20	700	3
SECI Peak	1,200	Jan-20	-	6
SECI RTC - 1	400	May-29	400	3
SECI Hybrid - III	1,110	Dec-20	-	2
SECI Hybrid - IV	1,200	Aug-21	-	2
MSEDCL Maharashtra	500	Jun-21	-	3
SECI Hybrid - V	1,170	May-22	-	3
TPDDL Hybrid	510	Mar-23	-	3
MSEDCL Peak Hybrid	250	Dec-22	-	9
REMC Hybrid	1,000	Apr-23	-	4
SECI Hybrid - VI	1,200	Apr-23	-	5
CESC Hybrid	150	May-23	-	3
	11040		**2,540**	

Source: I-Sec research

Repowering – to increase the market size

India started wind energy installation in 2003. A number of turbines are old and of lower capacities leading to suboptimal utilisation of the wind resources at the site. The draft repowering policy was floated by the power ministry to incentivise the replacement of these older turbines with new larger ones. Note that the Karnataka state regulator has approved repowering of the old turbines. Aim is to replace all turbines less than 2MW size under the new Policy. Overall, out of 25GW of turbines currently installed, <2MW are operational.

Chart 8: Operation wind capacity with less than 2MW turbines



Source: I-Sec research, Bloomberg

Table 10: Breakup of turbines (<2MW) by geography

GW	<0.5MW	0.5<x<1MW	1<x<1.5MW	1.5<x<2MW	Total (<2MW)
Tamil Nadu	1.2	2.9	1.8	1.5	7.4
Maharashtra	0.2	1.1	1.4	0.7	3.4
Karnataka	0.3	0.9	0.7	0.9	2.8
Gujarat	0	1.5	1.4	1.8	4.7
Rajasthan	0	1.2	0.8	0.9	2.9
Madhya Pradesh	0	0.3	0.3	1	1.6
Kerala	0	0	0	0	0
Andhra Pradesh	0.1	0.4	0.2	1.7	2.4
Total	**1.8**	**8.3**	**6.6**	**8.5**	**25.2**

Source: I-Sec research

It's not 'either or'… Wind is needed in the power mix

- **India is looking to decarbonise its power generation. The government has pledged to reduce carbon intensity by 45% from 2005 levels and to set up 50% of new capacity from renewable sources in FY30.**
- **A grid needs 24x7 power. Wind generates power during day and night. It also generates comparatively higher in monsoon, when solar is weak.**
- **Solar is cheaper than wind on per unit basis, but it is available only during day. For a grid, a mix of wind, solar and storage remains the cheapest solution.**
- **Also, optimal mix of generation study by the apex authority clearly established the need for more wind in the mix.**
- **The apex planning body has also advocated capacity addition of 8GW per annum till FY32**
- **Storage is costlier than having wind in the mix. Note that solar with storage will be ~3x costlier than wind power in the peak hours.**
- **Moreover, the commercial and industrial sectors are looking to meet their power requirements through renewables to meet their obligations. We are seeing more instances of customers looking for round-the-clock renewables – leading to new wind capacity addition.**
- **We expect India to add 3.5GW of wind energy capacity in FY24E and 4.5GW in FY25E.**

India is looking to decarbonise the grid under its commitment to global climate agreements. The available choices for decarbonisation are solar, wind and storage. However, storage is costly. Wind is a tad costlier than solar, but its generation profile is different. As a result, optimal mix for serving the load in a decarbonised world will be a combination of solar, wind and storage.

Note that the wind and solar are complementary to each other. Wind resources are diversified in the country because of varying patterns of wind. As a result, setting up diversified wind power plants across the width and breadth of country will yield an optimal outcome for the grid.

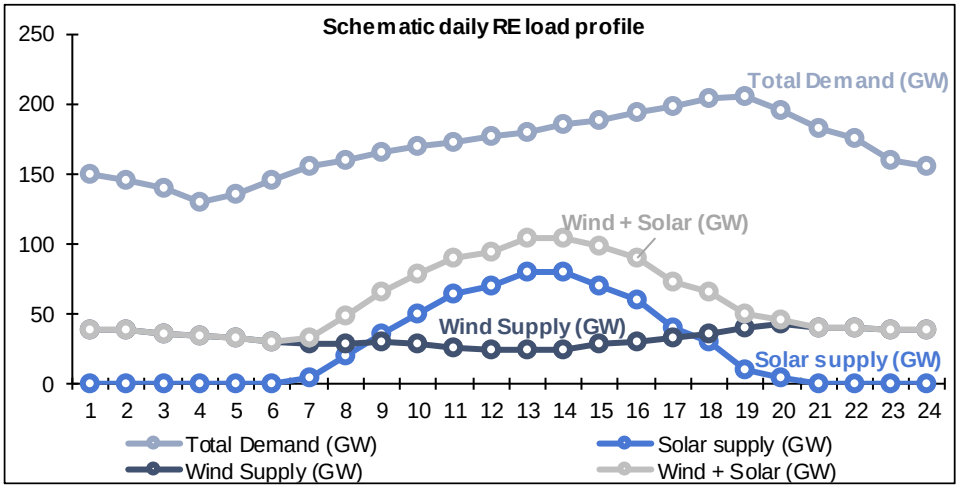
Wind power – is available during peak hours and is complementary to solar profile

On a normal day, power demand troughs in the early hours of the morning and then increases steadily over the day and reaches peak demand during the evening hours, usually between 7:00PM to 8:00PM. The actual demand curve however can vary daily and monthly, based on the geography or the end consumers as well. However, this is the general trend witnessed globally as well as across India.

To meet this demand, we require power generation capacities to be available 24x365. While solar generation is nil during the night, it increases steadily during the day and reaches its peak during the mid-day and then falls gradually back to nil till sunset.

Thus, solar generation is not available to meet peak demand during the evening hours. This is a major problem for grid stability as the grid has to fall back on thermal generation to meet the peak demand.

Chart 9: Schematic of daily power demand and source-wise generation trend

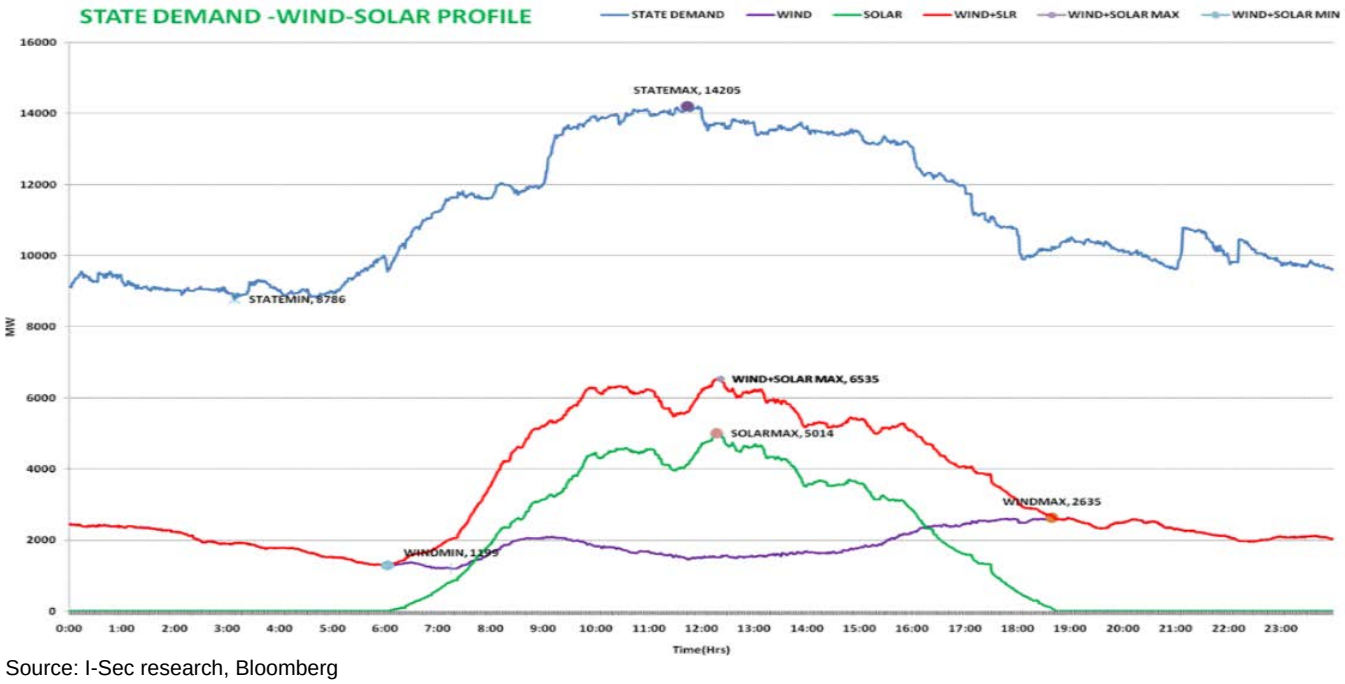


Source: I-Sec research, Bloomberg

However, wind power generation is relatively stable throughout the day and night. It is stable in the early hours of the day and touches its minimum during the mid-day when solar peaks, and later increases steadily to reach its maximum during the evening hours and remains steady later till midnight.

Thus, a combination of solar and wind is more reliable source of power for the grid as the variation in power generation in the combination is far less volatile compared to only solar generation.

Chart 10: Actual wind + solar load curve in Karnataka as on 19th Jun'23



Source: I-Sec research, Bloomberg

Storage is costly; wind reduces the system cost – and is cheap

Utility scale battery technology is still in the nascent stages and is relatively expensive at the current stage of evolution. While the cost of battery storage is likely to reduce, storage is still going to be a costly affair. As of now, storage is 3x costlier than wind power.

Battery storage remains the best long-term solution towards decarbonisation; however, it is still an economically unviable solution for India due to high costs.

Table 11: Cost comparison for various modes of generation and storage

Mode of generation	Energy cost (Rs/unit)	BESS (Rs/unit)	Tariff (Rs/unit)
Solar	2.5	7	9.5
Wind	3	7	10.0
Solar + Wind	2.7		2.8
Conventional	4		4

Source: I-Sec research

As a result, a combination of solar and wind is the best bet for a lowest-cost solution for a grid dominated by renewables.

More than 5.5GW of hybrid projects have been awarded in India over recent times through the bidding mechanism.

Table 12: Hybrid project trend in India

Bid	Capacity Awarded (MW)	Commissioned (MW)	Tariff (Rs/unit)
SECI Hybrid – I	840	840	2.67
SECI Hybrid -II	600	600	2.69
SECI Hybrid -III	1110	0	2.41
SECI Hybrid -IV	1200	0	2.34
MSEDCL Maharashtra	500	0	2.62
SECI Hybrid -V	1170	0	2.53
Total	**5420**	**1440**	

Source: I-Sec research

Also, to cater to off takers' demand for bringing firmness and flexibility in RE power, SECI has issued tenders with different configurations, viz. solar-wind hybrid, RE with assured supply during peak hours and round-the-clock RE, with provision for a combination of different RE/energy technologies and/or energy storage, as needed.

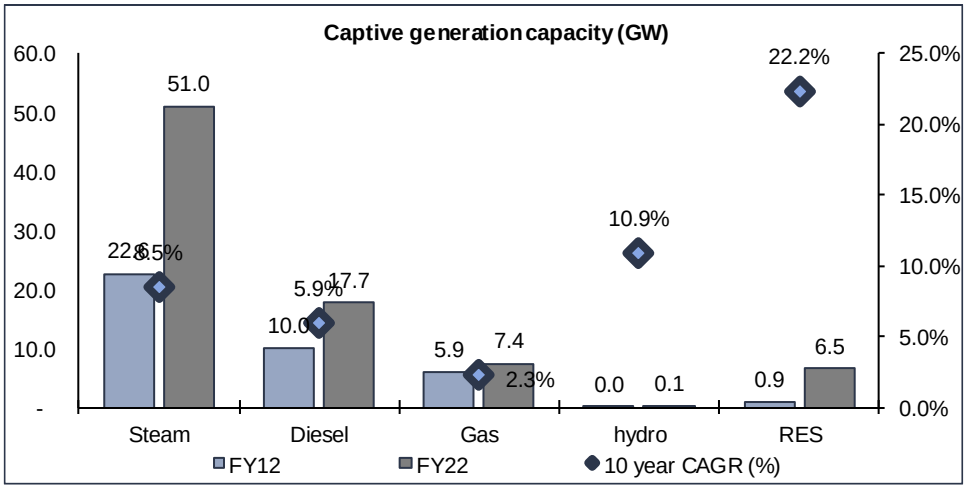
Of the 5.5GW of tendered hybrid capacity, 1.4GW has already been commissioned and the rest is expected to be commissioned in the next 1-2 years.

Commercial and industrial demand – The upcoming growth drivers

Industrial captive power shifting to renewables

Industries like cement, steel, etc. have over the years set up their own power generation capacities to derisk from supply risk, tariff risk, etc. Thermal power generation being the most affordable and reliable, most of the industries set up thermal capacity to meet their captive demand.

Chart 11: Captive power generation too moving towards RE power

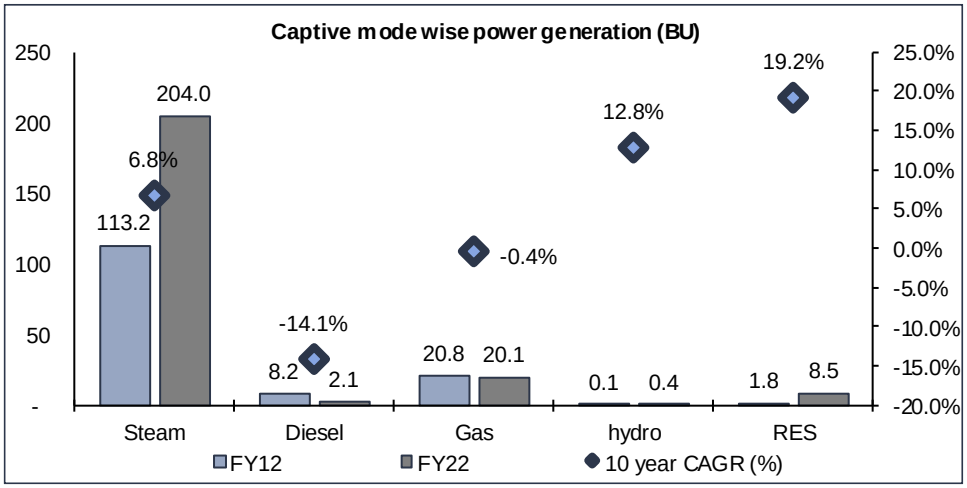


Source: I-Sec research, Bloomberg

Note that commercial and industrial consumers are obligated to meet the renewable purchase obligations. Also, the world is moving towards renewable energy and there is growing demand from consumers to consume products with least carbon footprint and are willing to pay a premium (exports market) for it as well.

This shift is already being witnessed in the commercial and industrial captive power generation capacity addition. The industry is moving towards RE energy for incremental capacity addition.

Chart 12: Captive mode-wise power generation (BU)



Source: I-Sec research, Bloomberg

Over the last decade, captive RE capacity addition witnessed a CAGR of 22.2% to 6.5GW as of FY22, whereas the conventional capacity addition growth has been far below 10%. The total captive generation capacity stands at 83GW as of FY22 (*vs* 39GW in FY12).

The trend is even more evident when we compare the mode of captive power generation. Power generation from RE sources has registered a CAGR of 19% over the last decade to 8.5BU in FY22 (*vs* 1.8BU in FY12). Coal-based generation CAGR has been 7% to 204BU during the same period while gas and diesel based generation has seen a decline.

Table 13: Wind capacity addition required for C&I segment

	C&I captive base power demand growth (%)	Estimated base demand at 2030 (BU)	RES base demand (BU) at 50% RPO	Wind base demand at 50% share of RES	Wind capacity (GW) at 50% share of RES and 30% PLF
Bear case	5%	347	174	87	33
Base case	7%	404	202	101	38
Bull case	9%	468	234	117	45

Source: I-Sec research

While the shift to RE energy is at a very nascent stage, going forward it is likely to only gain more momentum. For FY22, C&I segment has generated 235BU of captive power for industrial use. We estimate, under the base case scenario, C&I power demand CAGR at 7% over FY22-FY30.

We estimate captive renewable energy sources to account for 50% of the base demand for C&I segment by 2030. Thus, under the base case, it will require to source 202BU from renewable sources by 2030. Given the RTC power requirement for industrial customers, 50% of the renewable energy will be needed to be sourced from wind capacities – and thus, assuming 30% PLF for wind energy, 38GW of incremental wind capacity will be needed by 2030.

Under the bear case scenario, this incremental capacity addition is expected at 33GW and under the bull case it stands at 45GW.

Recent examples of commercial and industrial consumers – wind demand

Tata Steel has awarded 966MW round-the-clock capacity to Tata Power Renewable Energy in Mar'23. Of this, wind consists of 587MW and solar consists of 379MW.

Serentica Renewables, promoted by Vedanta and KKR, is looking to develop 2.5GW of renewables capacity. It has awarded wind turbine orders to Suzlon, Envision and Gamesa.

Renew Power, a major renewable IPP, is looking to set up 592MW wind capacity for commercial and industrial projects.

NTPC Renewable Energy Ltd, a wholly-owned subsidiary of NTPC Green Energy Limited, has signed a term sheet with Greenko ZeroC Pvt Ltd (a Greenko group company) on 28th Mar'23 to supply 1400MW round-the-clock RE power for powering Greenko's upcoming green ammonia plant at Kakinada, India.

A leading power generation company is looking to set up 3.8kt of green hydrogen facility to cater to group captive production of green steel. This project is likely to require 25MW of round-the-clock (RTC) power generation capacity.

Green hydrogen – take-off will be a boon for wind energy

India has set a target to install 5mtpa of green hydrogen manufacturing capacity by 2030. It will require 125GW of renewable capacity (in addition to RE capacity addition target to meet power demand) addition by 2030. Note that, 125GW of RE capacity required to produce 5mtpa of hydrogen is not considered under the RE capacity target of 500GW by 2030.

This 125GW of renewable capacity addition will most likely require round-the-clock / hybrid / solar + battery or solar + wind + battery power generation capacity. Given the high cost of battery storage, it is most likely that most of this 125GW of RE capacity will be hybrid or RTC.

Thus, we estimate around 25-30GW of wind capacity addition requirement towards production of green hydrogen.

This further buttresses the argument for a mix of wind capacity with solar for setting up RTC capacity as pure solar + battery is very expensive and is not commercially and economically feasible at the moment.

For example, NGHC is setting up a mega plant to produce green hydrogen for global export in the form of green ammonia with a total investment of US$8.4bn. Under these contracts, L&T will engineer, procure, and construct a 2.2GW AC PV solar plant, 1.65GW wind generation balance of plant and a 400 MWh battery energy storage system under the power elements package.

Suzlon has 'right to win' in domestic wind industry

- **Suzlon Energy (Suzlon) has supplied 14GW in domestic wind equipment markets – translating to 33% share in Indian markets. Overall, it has installed 20GW in global markets**
- **Company has proven experience of operating and maintaining wind power turbines for >25 years in Indian wind equipment markets.**
- **Also, it has done supply and EPC work for wind installations across all the 8 windy states. As a result, it is best suited to offer complete solutions.**
- **Moreover, it has blade plants in all states providing it a significant cost advantage. Note that wind is more of a local industry.**
- **Suzlon has been able to innovate and bring the latest technology available in wind markets. It has a strong research and development team in Germany.**
- **Suzlon has been able to ensure that its market share in India is >25% even in the worst of years.**

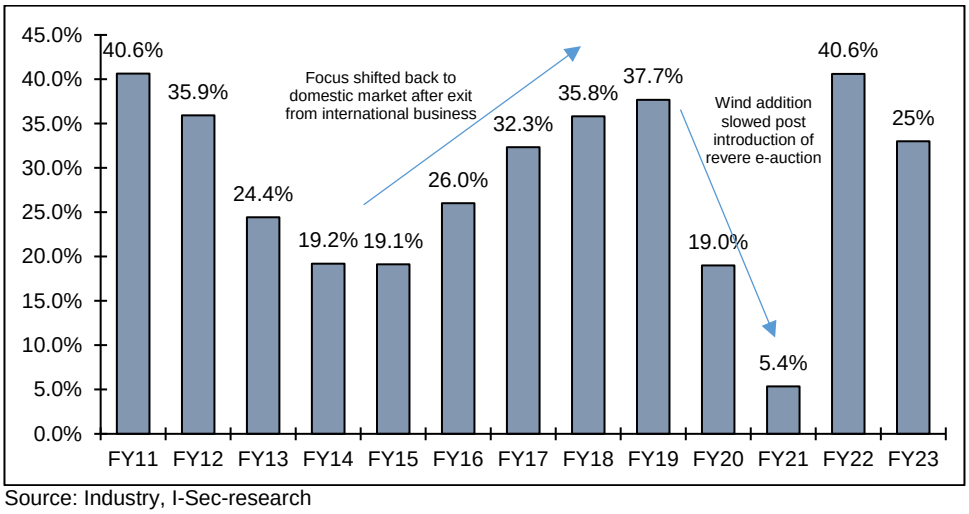
Suzlon is market leader by a distance in domestic markets

Suzlon continues to be the market leader in the wind turbine generator space, enjoying >30% share in India. Its domestic market share was affected in a few years (*refer to chart below*), primarily due to liquidity constraints, withdrawal of AD/GBI benefits and global slowdown. Covid also impacted the business during FY20-FY21.

However, in FY22, Suzlon regained its lost market share in the Indian wind equipment sector. Its market share jumped to 40.6% in FY22 and 25% in FY23 from 19% in FY20 on account of pent-up demand and supported by financial restructuring of the balance sheet. Its current market share is around 33% with 14GW of wind energy installed base (19.8GW globally) (Source: company)

We expect Suzlon to gain further market share on the back of its robust orderbook (*vs* competitors).

Chart 13: Suzlon – maintaining its market share



Source: Industry, I-Sec-research

Table 7: Wind capacity addition by key players globally

MW	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23
Wind Power Cap Add (GW)	1,699	2,083	2,312	3,461	5,502	1,739	1,544	2,068	1,495	1,118	2,265
Cumulative Cap (GW)	19,053	21,264	23,448	26,908	32,410	34,149	35,693	37,761	39,256	40,374	42,649
MW											
Suzlon	415	400	442	900	1,779	623	582	393	80	459	505
Winworld (India)	454	356	232	189	80	52	-	-	-	-	
Regen Power tech	273	331	411	314	370	36	25.5	-	-	-	
General Electric	122	199	139	127	400	78	132	227	371	41	613
Vestas	34	80	42	-	100	198	481	310	94	97	57
Gamesa	89	425	657	1,004	2,005	560	261	620	607	324	535
Inox Wind	264	150	272	790	656	172	36	227	98	142	37
Total	**1,699**	**2,083**	**2,312**	**3,461**	**5,502**	**1,739**	**1,544**	**2,068**	**1,495**	**1,118**	**2,275**
	2nd Rank		3rd Rank		4th Rank						
Suzlon	4	19	19	26	32	36	38	19	5	41	22
Winworld (India)	27	17	10	5	1	3	-	-	-	-	-
Regen Power tech	16	16	18	9	7	2	2	-	-	-	-
General Electric	7	10	6	4	7	4	9	11	25	4	28
Vestas	2	4	2	-	2	11	31	15	6	9	3
Gamesa	5	20	28	29	36	32	17	30	41	29	24
Inox Wind	16	7	12	23	12	10	2	11	7	13	2
RRB Energy	-	-	-	1	2	1	2	14	6	5	-
Others	3	7	5	3	-	-	-	-	-	-	-
	4th Rank				-	-	-				
Cumulative Installations (GW)											
Suzlon	8	8	9	10	11	12	12	13	13	13	14
Winworld (India)	4	4	5	5	5	5	5	5	5	5	5
Regen Power tech	1	1	2	2	2	2	2	2	2	2	2
General Electric	0	0	0	1	1	1	1	1	2	2	2
Vestas	2	2	2	2	2	2	3	3	3	3	3
Gamesa	1	1	2	3	5	5	6	6	7	7	8
Inox Wind	0	0	1	2	2	2	2	3	3	3	3
RRB Energy	1	1	1	1	1	1	1	1	1	1	1
Others	2	2	3	3	3	3	3	3	3	3	3
Total	**19**	**21**	**23**	**27**	**32**	**34**	**36**	**38**	**39**	**40**	**43**

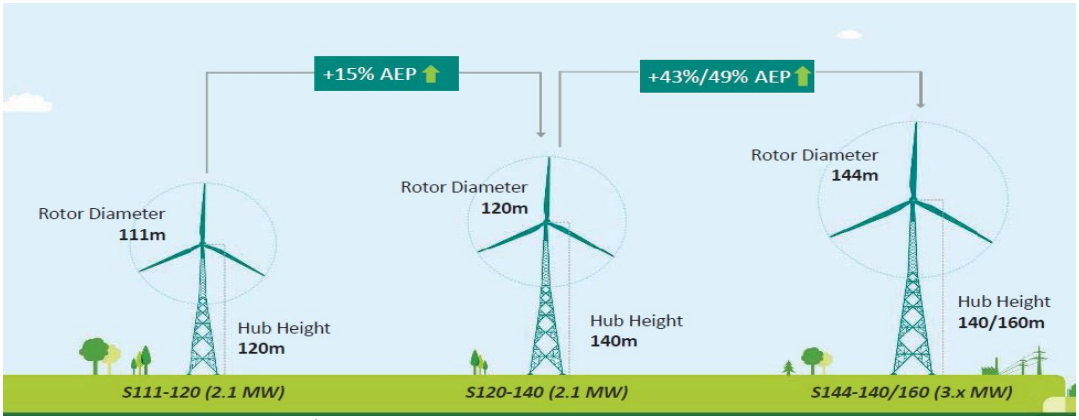
Source: Industry, I-Sec-research

Superior product portfolio – keeping up with the global trend

Suzlon has pursued technological innovations in-house (its R&D centre is in Germany). Company's latest products can operate at sites with low wind speed (suitable for Indian markets) and are competitive. Suzlon's recent product lines (S144- 3W MW series) will have higher realisations per MW (than earlier versions) and will have wider rotor diameter, delivering higher energy output at lower cost. Company continues to introduce improved machines (likely to be higher MW turbines, more suited for new wind sites).

We note that, out of the current orderbook of 1542MW, 780MW is for the new 3 MW series. In our view, this is a testament to Suzlon's innovative capability and product acceptance.

Chart 14: Products optimised for higher energy output



Source: Company, I-Sec-research

This demonstrates Suzlon's ability to keep up with the global trends

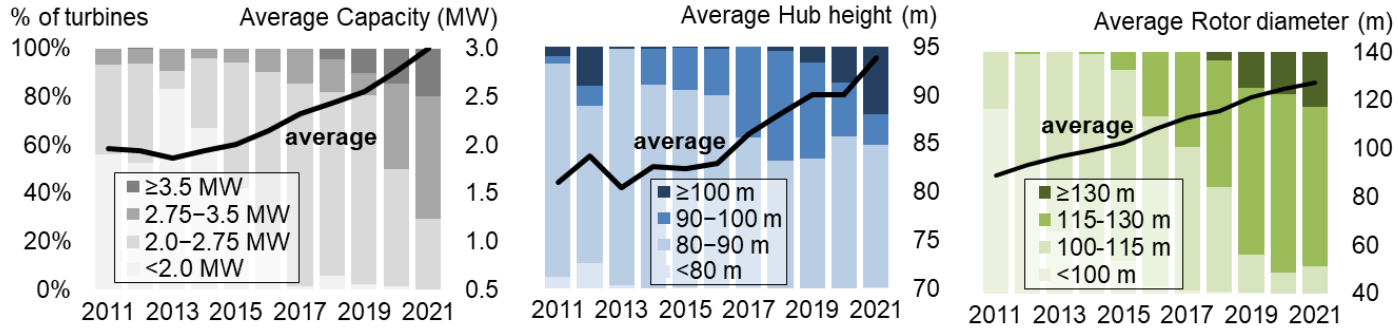
Globally, OEMs are tweaking the hub height and the rotor diameter to enable housing higher-capacity turbine at the top of the tower.

This trend is shifting so fast that from CY11 to CY21 the average rotor diameter of the turbines installed has increased by 43% from 89m in CY11 to 128m in CY21.

Similarly, 88% of the wind turbines installed in CY11 had an average hub height of 81m. While in CY21, 43% of the installed turbines had an average hub height of more than 100m.

This has enabled to more than 50% increase in turbine capacity per tower to 3MW in CY21 from 1.9MW in CY11.

Chart 15: Trends in turbine nameplate capacity, hub height, and rotor diameter



Source: Land based wind market report 2022, I-Sec research

Higher capacity turbines mean that fewer turbines are needed to generate the same amount of energy across a wind plant—ultimately leading to lower costs. While higher capacity turbines do not necessarily bring down the cost of installation for the power generator, it significantly reduces the cost of balance of plants capacity significantly. As the number of turbines required to produce a certain capacity reduces as the capacity per turbine increases, the cost of evacuating the power from each tower reduces.

Sharp pick-up in order wins as industry revives

As explained above, government is pushing to revive wind capacity addition in India power mix with new policy measures. Wind tendering and awarding activity too has seen a sharp pick-up.

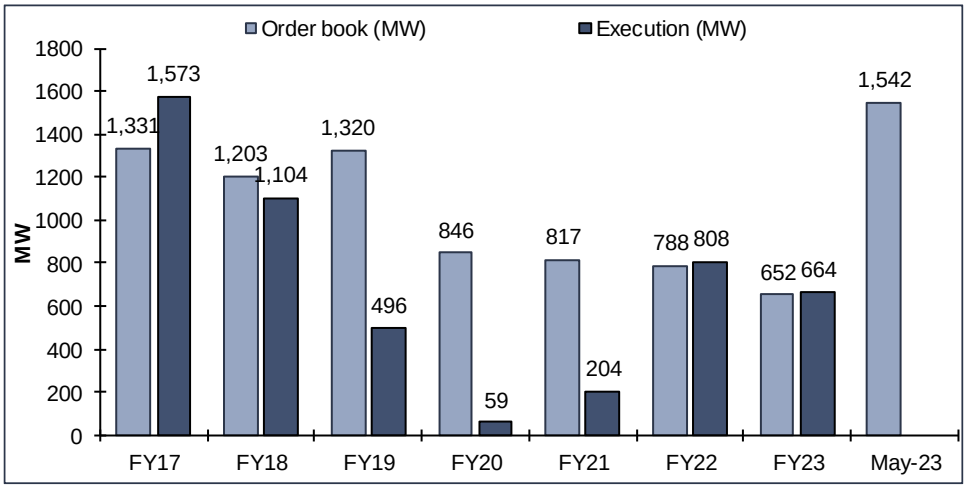
Suzlon being the market leader in the segment is well positioned to capitalise on this new trend and the results are already evident.

Table 14: Recent order wins for Suzlon; FY24-YTD order wins at 830MW

Date	Order wins (MW)	Order source	Product configuration (no. of turbines x Size)
May-23	300	Torrent power	100 X 3 MW
May-23	204	Serentica Renewables	68 X 3 MW
May-23	69	A Nordic company	23 X 3 MW
May-23	99	Vibrant Energy	33 X 3 MW
May-23	69	Juniper Green	23 X 3 MW
Apr-23	39	Thermax	13 X 3 MW
Apr-23	50	Sembcorp	24 X 2.1 MW
Oct-22	48	Adani Green	23 X 2.1 MW
Oct-22	145	Aditya Birla group	69 X 2.1 MW
Sep-22	180	Sembcorp	86 X 2.1 MW
Total in FY24-YTD	**830**		

Source: I-Sec research

Chart 16: Suzlon reports a new high in order backlog in recent years



Source: I-Sec research

Suzlon has witnessed a sharp pick-up in recent order wins with 830MW of orders in Q1FY24 already booked. The orderbook has improved to 1.5GW as of May'23 with the addition of new orders.

Note that, over 90% of the recent order wins of 830MW are for the new indigenously developed 3MW wind turbine by Suzlon. This showcases product acceptance and demand for high-capacity turbines.

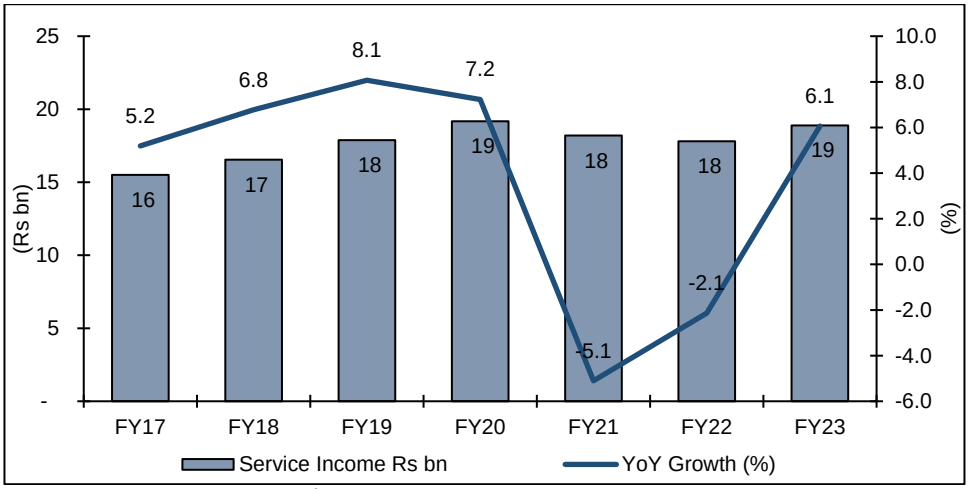
Suzlon has proven experience of operating and maintaining wind power turbines for 20 years

Suzlon has ~16.1GW of wind power plant capacity under O&M services. Company's service business contributes ~30% of the total revenue, and has been growing at a steady rate. Suzlon's services business yields higher margins than pure turbine manufacturing and offers steady long-term growth.

As wind farms last 25 years (and given their need to be serviced regularly), suppliers are able to get service agreements on the vast majority of new turbine sales with multi-year contracts. Suzlon has retained 100% of its existing O&M contracts that come up

for renewal each year *vs* 75% each for Vestas and Gamesa, the global wind turbine manufacturers.

Chart 17: Suzlon – service revenues

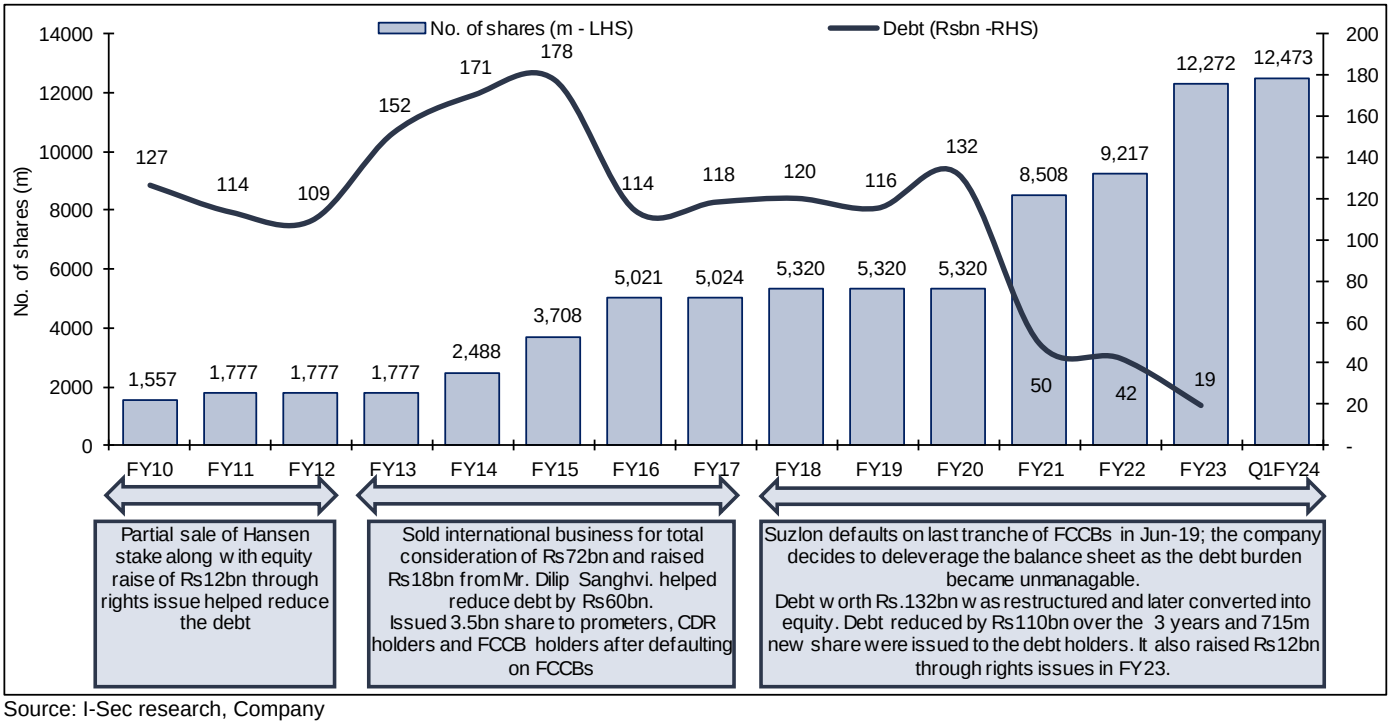


Source: Company, I-Sec research

Leverage is a relic of the past

- Suzlon Energy (Suzlon) acquired global wind equipment manufacturer, RE Power in FY08 through debt. Due to fall in wind equipment markets, RE Power revenue and profit declined – resulting in losses.
- Suzlon has undergone restructuring thrice in its history – first one in FY13, the second in FY17 and the last one was recently in FY20.
- It went through its first restructuring in FY13 after defaulting on FCCBs. It offered moratorium on term and working capital loans, reduction in interest cost, enhancing the working capital facility, etc.
- After restructuring, Suzlon started focusing on domestic markets. However, the recovery in domestic market was short-lived
- India domestic market nosedived leading to losses from FY18. Thus, it became difficult for Suzlon to service the debt. Suzlon defaulted on FCCBs (worth US$170m) in FY20.
- As a result, debt was restructured again in FY20 leading to issue of equity and conversion of FCCB into equity
- The debt was refinanced again in May'22; however, most of the debt was converted into equity or equity-like instruments.
- However, the Rs110bn reduction in debt over the last three years has come at the cost of equity dilution (131%).

Chart 18: History of equity dilution and debt restructuring



Source: I-Sec research, Company

Suzlon raised a substantial amount of debt because of acquisitions. It went into trouble due to weakness in its end markets. As a result, it underwent a series of restructurings and its troubles are now largely over with debt reducing to <1x 'net debt to EBITDA', a

comfortable ratio for a capital goods company. It had 155mn shares in FY09. To reduce the debt, it has converted debt into equity and raised money in various tranches through rights and preferential issue as explained below:

FY06-FY10: the expansion phase – funded by debt

Suzlon raised Rs14bn through an IPO in FY06 for expansion of its manufacturing facilities in India, capital infusion into subsidiaries and working capital requirement. To gain global footprint, Suzlon entered the US and Chinese markets through acquisitions like Hansen Transmissions and Senvion. Note that it acquired Senvion at an EV of EUR1.4bn or Rs75bn and Hansen at an EV of EUR435m or Rs25bn.

A large part of these acquisitions were funded by debt and thus its debt ballooned from mere Rs2.4bn in FY04 to Rs127bn in FY10.

FY10-FY12: Partial stake sale and rights issue led to debt reduction

Suzlon in 2006, acquired 100% stake in Belgium-based wind gearbox manufacturer Hansel for a total consideration of Rs32bn owing to its synergies in manufacturing wind turbines.

Suzlon's stake diluted to 61% owing to after raising fresh money from new investors till FY08. In order to reduce the mounting debt, Suzlon decided to sell its partial stake in Hansel (36%) for Rs17bn in FY11.

Further in FY11, it raised Rs12bn through a rights issue after issuing 189mn new shares to its existing investors. These two transactions helped reduce the debt to Rs110bn in FY12 (*vs* Rs127bn in FY10).

FY13-FY17: Second round of debt restructuring; 3bn shares issued

Owing to lower volumes, Suzlon defaulted on US$207mn foreign currency convertible bonds (FCCBs) in Oct'12 and triggered default clauses on the remaining outstanding FCCBs. This further dried out liquidity for Suzlon to execute its ongoing projects and thus execution volume fell to 252MW in FY13 (vs 1,583MW in FY12).

Suzlon raised Rs36bn from the bonds to meet the necessary working capital requirement and, through a corporate debt restructuring programme, availed of moratorium on principal and interest repayment for term and working capital loans, reduction in interest rates, enhanced working capital facility by Rs18bn and converted Rs15bn loans into equity.

However, volumes remained sluggish at 723MW and 454MW in FY14 and FY15 respectively. This led to further increase in debt to Rs178bn by FY15.

After FY15, Suzlon decided to focus on the domestic market and exit from all its international businesses. It sold Senvion for a total consideration of Rs72bn and the money was used to repay the existing debt.

Meanwhile, after defaulting on FCCBs, Suzlon restructured its outstanding FCCBs with longer maturity and lower conversion prices. After FY15, these FCCBs were being converted into equity shares and a total of 1.5bn shares were allotted to FCCB holders

for a price of Rs15.5/share. Also, the company raised Rs1bn by issuing preferential shares to a financial investor.

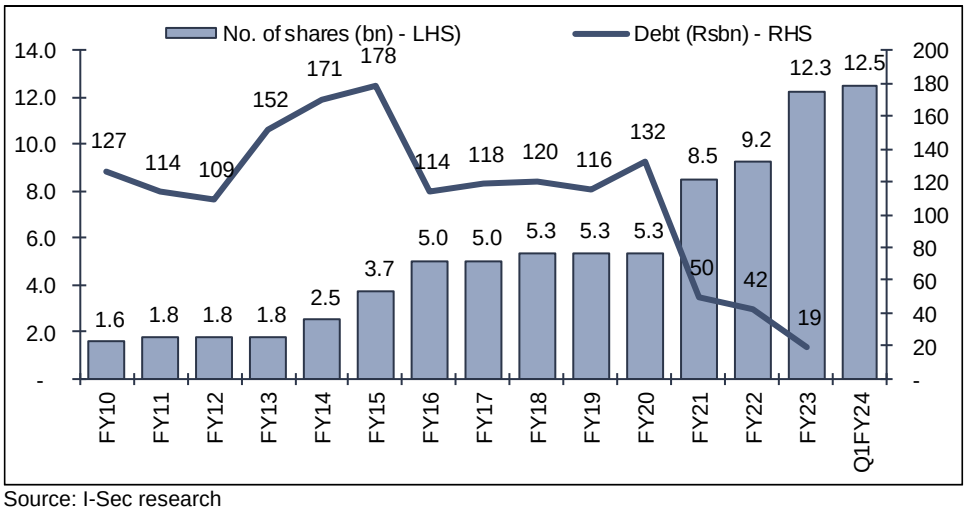
FY18-FY23: Third restructuring; 7bn equity shares issued – leading to sharp decline in debt

As discussed earlier, industry volumes declined during FY18-FY23. Suzlon wind sales volumes fell from 1.6GW in FY17 to 942MW, 496MW and 59MW in FY18, FY19 and FY20 respectively. As a result, it made losses during this extended period.

Suzlon defaulted on its FCCB payments in FY20. It proposed a debt resolution plan for all the lenders and FCCB holders. Under the restructuring, it issued 3.8bn equity shares to lenders, promoters and FCCB holders. FCCB debt was converted into equity at a revised conversion price of Rs6.7/share and the lenders' debt was converted into equity shares at face value.

During FY23, Suzlon refinanced the existing set of lenders from loans from a new set of lenders. It issued 0.6bn shares to existing lenders. Further, it has raised Rs12bn through a rights issue in FY23 at Rs5/share (or 2.4bn shares). Thus, the debt for Suzlon as of Mar'23 stands at Rs19bn (*vs* Rs132bn in FY20). Note that the number of shares has increased 8x in the last 13 years (the total number of shares has increased to 12.5bn as of Mar'23 *vs* 1.5bn as of Mar'10).

Chart 19: Balance sheet restructuring



Source: I-Sec research

Financials

- **Suzlon has had a tumultuous history as it focussed on capturing market share in the 2000s and grew inorganically through global acquisitions (largely funded by debt).**
- **However, after the financial crisis, global wind capacity addition (ex-China) slumped and later grew at a slower pace. This impacted Suzlon's financial health as its acquired capacity was unable to deliver higher volume owing to lack of demand and thus the debt burden kept on increasing.**
- **Over the years, Suzlon sold its foreign businesses and has decided to focus purely on the domestic market. However, the domestic market too slumped in the aftermath of reversal of the feed-in tariff mechanism.**
- **Government policy and the business environment for wind capacity is looking up after a long time. Suzlon, being the market leader in the domestic market, is expected to be the natural beneficiary of the same, in our view.**
- **We expect Suzlon to add 900MW/1,400MW in FY24E/FY25E, as domestic wind capacity addition is expected to be 3GW in FY24E and 4.5GW in FY25E.**
- **Led by higher capacity addition, we expect Suzlon revenue CAGR at 37% to Rs112bn till FY25E and EBITDA CAGR at 37% to Rs15.5bn over the same period.**
- **Lower debt burden will help keeping the finance cost in check and thus we expect PAT to grow to Rs11bn in FY25.**

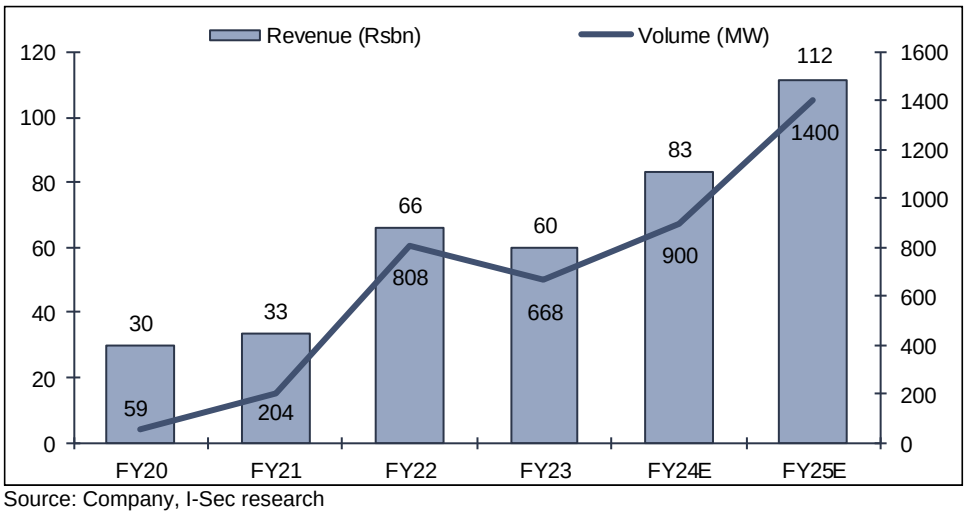
Between FY07-FY22, Suzlon continued reporting losses (except for FY17) due to weak volumes and higher interest cost. However, for FY23, company reported PAT of Rs1.7bn, supported by 43% YoY decrease in interest cost (due to 80% YoY reduction in debt) and tax shield on account of accumulated losses.

We expect a turnaround in Suzlon's fortunes led by strong orderbook and deleveraged balance sheet. Consequently, the company should be able to regain its pole position in an oligopolistic market. Moreover, headwinds are firmly behind Suzlon, ensuring its return to sustainable profitability.

We model wind volumes to register a CAGR of 45% FY23-FY25E on strong domestic demand revival. Suzlon's volumes were subdued and volatile in the past decade due to weak demand resulting from unfavourable government policies, which was further aggravated by the covid pandemic.

Going forward, we pencil Suzlon to retain 35-40% share in the Indian market. Our volume expectations for FY24E/FY25E are 900MW/1400MW, which works out to 45% CAGR. Our strong volume growth expectations are premised on various policy actions specific to wind + industry demand + more round-the-clock contracts. We expect auction of ~10GW per annum in the country as targeted by the government.

Chart 20: Volumes to see strong uptick (MW)



Source: Company, I-Sec research

Revenue growth robust at ~37% over FY23E-25E

Aided by an increase in volumes and steady revenues from the services, we expect revenues to grow from Rs60bn in FY23 to Rs112bn in FY25E, CAGR of ~37%. We have modelled 45% CAGR in wind volumes. Moreover, we expect service business of the company to contribute meaningfully – we have modelled 4% CAGR between FY23-FY25E.

Table 15: Revenue breakup

Rs bn	FY23	FY24E	FY25E
Revenues	60	77	111
WTG Revenues	38	58	91
Service Revenues	19	20	20

Source: I-Sec research

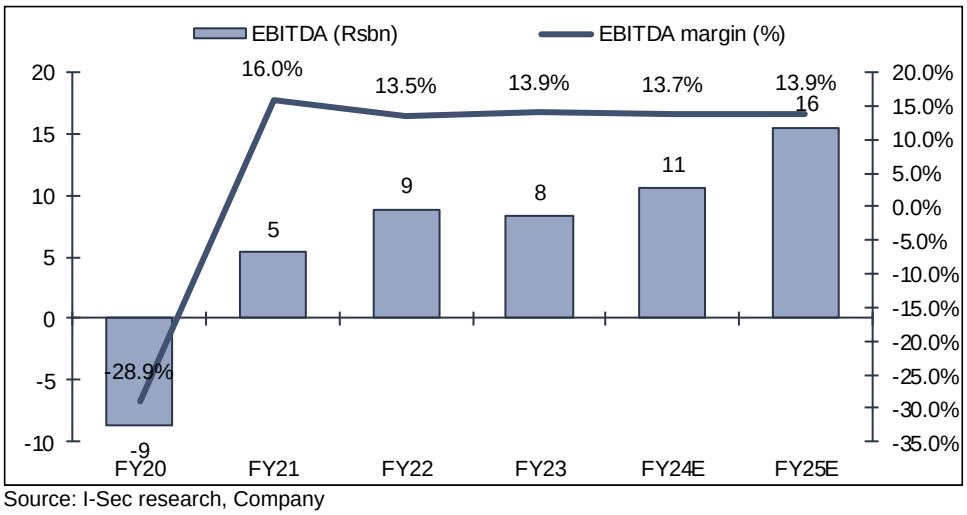
O&M revenues to grow steadily over FY23-FY26E

Suzlon has ~16.1GW of wind power plant capacity under O&M services. The existing portfolio generates ~Rs19bn in service revenues. We expect this to grow 4% YoY based on general inflationary trends (built into the contract) and capacity addition. However, we note that, on the newly installed capacity, O&M services are free for initial two years.

EBITDA margin to remain steady over FY23-FY25E

Despite large increase in wind capacity addition expected over the next two years, we have maintained a conservative operating margin profile. We expect EBITDA margins to remain flat at 13.9% in FY25E.

Chart 21: EBITDA margins are expected to remain flat at 14% in FY25E



Source: I-Sec research, Company

Thus we expect EBITDA growth to be largely driven by higher volume and we estimate EBITDA of Rs16bn in FY25E *vs* Rs8bn in FY23.

Interest cost

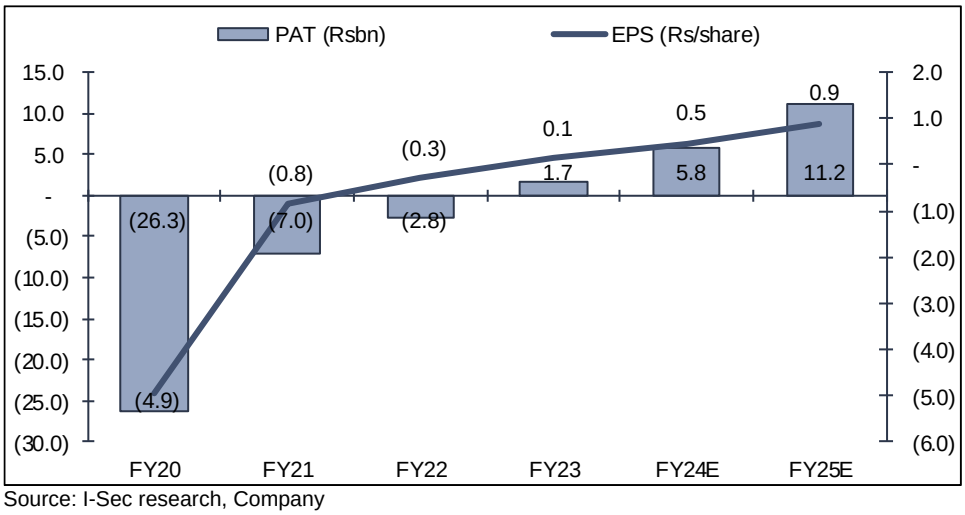
After the second round of restructuring, Suzlon's gross debt has reduced drastically from Rs130bn in FY20 to Rs19bn as of Mar'23. Also, net debt is reduced further to Rs12bn as of Mar'23.

Thus, owing to the reduced debt, we expect finance costs to moderate to Rs2.3bn-2.4bn per year going forward (including working capital debt cost).

Suzlon likely to post PAT of Rs11bn in FY25E

We estimate Rs4.8bn/Rs11bn profits in FY24E/FY25E driven by 37% revenue CAGR (FY23-FY25E). We note that the company has accumulated losses, which will lead to NIL taxes between FY24/25E.

Chart 22: Profit estimates – Turning the corner



Source: I-Sec research, Company

Key risks

- **Delay in execution ramp-up:** Suzlon has been executing <1GW of wind capacity in the last few years. Despite its large orderbook, operational and supply chain challenges could pose a risk to Suzlon's ability to increase its execution going forward.
- **Renewables curtailment and lack of transmission evacuation:** Investment in transmission is critical for setting up new capacity. A lack of transmission evacuation could slow down the setting up of new capacities. Grid is looking to upgrade its transmission to ensure smooth evacuation of renewables capacity.
- **Delay in auction of renewables:** Government has set a target of auction of 10GW for wind annually. A slowdown in auctioning could lead to a sluggish growth in wind turbine markets.
- **Increase in competitive intensity:** Suzlon remains a formidable competition in the domestic market. However, a Chinese entrant – Envision – has been able to ramp up and build a 2GW orderbook. Siemens Gamesa is also a formidable competitor. We believe Suzlon's market loss is also explained by its inability to service debt effectively.
- **Increasing market share of IPPs:** Note that the increasing market share of IPPs could lead to low EPC business as IPPs are looking to install wind equipment on their own and are entering into a supply contract for wind turbines.
- **Rise in raw material costs:** Raw material expenses are ~45-50% of Suzlon's sales. Suzlon sources steel, epoxy and glass fabrics, which are subject to price fluctuations. Further, any disruption in raw material supply chain could delay/disrupt the delivery of wind turbines, thus leading to earnings/reputation risk.
- **Financial health of discoms:** Discoms are the ultimate buyer of electricity. However, deteriorating financial health of discoms could lead to delay in payments for wind developers eventually leading to low installations. To improve the financial health of discoms, the government has launched two pronged initiatives: a) smart metering of households, and b) revamped distribution sector scheme.

About the company

Table 16: Key managerial personnel and board of directors

Name	Designation	Qualification & Experience
Vinod Tanti	Chairman & MD	Mr. Vinod Tanti is a founding member of Suzlon Energy Limited. He has a bachelors' degree in civil engineering. He was also the chief operating officer of Senvion, Germany, from 1st Jun'12 till 15th Jun'13, at a time when Senvion was a global leader in wind turbine technology.
Girish Tanti	Executive Vice-chairman	Mr. Girish Tanti is also a founding member of Suzlon Energy Limited. He has a bachelor's degree in electronics & communication engineering and holds a master's degree in business administration from the UK.
J.P. Chalasani	Chief Executive Officer	Mr. Chalasani joined the Suzlon Group in Apr'16 as chief executive officer. Post a highly successful tenure as CEO, he transitioned to a strategic advisor role with the group in Jul'20. He was reappointed CEO of the Suzlon Group on 5th Apr'23.

Source: Company, I-Sec research

Price chart

Source: Bloomberg

Financial summary

Table 17: Profit & Loss statement

(Rs mn, year ending March 31)

	FY22	FY23	FY24E	FY25E
Total Income	**65,818**	**59,705**	**77,545**	**1,11,580**
Operating Expenses	**56,923**	**51,386**	**66,923**	**96,056**
EBITDA	**8,894**	**8,319**	**10,622**	**15,525**
% margins	13.5	13.9	13.7	13.9
Depreciation & Amortisation	2,598	2,597	2,416	2,434
EBIT	**6,296**	**5,722**	**8,205**	**13,090**
Gross Interest	7,345	4,208	2,595	2,425
Other Income	222	196	200	550
Recurring PBT	**(827)**	**1,711**	**5,810**	**11,215**
Add: Extra ordinaries	1,006	27,208	-	-
Add: Share in associates	(104)	-	-	-
PBT	**75**	**28,919**	**5,810**	**11,215**
Less: Taxes	1,841	46	-	-
Less: Minority Interest & Share in associates	-	-	-	-
Net Income (Reported)	**(1,766)**	**28,873**	**5,810**	**11,215**
Adjusted Net Income	**(2,772)**	**1,665**	**5,810**	**11,215**

Source: Company data, I-Sec research

Table 18: Balance sheet

(Rs mn, year ending March 31)

	FY22	FY23	FY24E	FY25E
Assets				
Total Current Assets	53,667	42,641	47,447	64,403
of which cash & cash eqv.	5,004	3,673	3,177	4,575
Total Current Liabilities & Provisions	27,227	24,509	24,579	31,864
Net Current Assets	**26,440**	**18,132**	**22,868**	**32,539**
Investments	0	0	0	0
Other Non-Current Assets	292	402	402	402
Net Fixed Assets	**10,789**	**8,670**	**9,272**	**7,838**
Goodwill	-	-	-	-
Total Assets	**37,522**	**27,205**	**32,543**	**40,779**
Liabilities				
Borrowings	71,619	19,049	15,771	13,771
Deferred Tax Liability	1,521	(2,835)	(29)	(1,008)
Minority Interest	(361)	-	-	-
Equity Share Capital	18,435	24,544	24,544	24,544
Face Value (Rs.)	2.00	2.00	2.00	2.00
Reserves & Surplus	(53,692)	(13,553)	(7,743)	3,472
Net Worth	**(35,257)**	**10,992**	**16,802**	**28,016**
Total Liabilities	**37,522**	**27,205**	**32,543**	**40,779**

Source: Company data, I-Sec research

Table 19: Cashflow statement

(Rs mn, year ending March 31)

	FY22	FY23	FY24E	FY25E
Operating Cashflow	**(70)**	**4,262**	**8,226**	**13,649**
Working Capital Changes	4,616	6,976	(5,233)	(8,272)
Capital Commitments	653	478	3,019	1,000
Free Cashflow	**5,200**	**11,716**	**6,012**	**6,377**
Cashflow from Investing Activities	**(230)**	**-**	**-**	**-**
Issue of Share Capital				
Buyback of shares				
Inc (Dec) in Borrowings	(3,526)	(52,570)	(3,277)	(2,000)
Interest paid	(7,345)	(4,208)	(2,595)	(2,425)
Dividend paid	-	-	-	-
Extraordinary Items/Others	**8,281**	**43,731**	**(636)**	**(553)**
Chg. in Cash & Bank balance	**2,379**	**(1,331)**	**(497)**	**1,398**

Source: Company data, I-Sec research

Table 20: Key ratios

(Year ending March 31)

	FY22	FY23	FY24E	FY25E
Per Share Data (in Rs)				
Diluted adjusted EPS	-0.3	0.1	0.5	0.9
Recurring Cash EPS	-0.3	0.1	0.5	0.9
Dividend per share (DPS)	-	-	-	-
Book Value per share (BV)	-3.8	0.9	1.3	2.2
Growth Ratios (%)				
Operating Income	96.7	(9.3)	29.9	43.9
EBITDA	66.4	(6.5)	27.7	46.2
Recurring Net Income	(60.5)	(160.1)	248.9	93.0
Diluted adjusted EPS	(65.1)	(146.9)	243.4	93.0
Diluted Recurring CEPS	(65.1)	(146.9)	243.4	93.0
Valuation Ratios				
P/E	(51.0)	108.8	31.7	16.4
P/CEPS	(51.0)	108.8	31.7	16.4
P/BV	(3.9)	16.5	11.0	6.6
EV / EBITDA	28.2	24.0	18.5	12.4
EV / Operating Income	3.8	3.3	2.5	1.7
EV / Operating FCF (pre - Capex)	55.1	17.7	65.7	35.9
Operating Ratios				
Raw Material/Sales (%)	0.8	0.8	0.8	0.8
SG&A/Sales (%)	0.1	0.1	0.1	0.1
Other Income / PBT (%)	(0.3)	0.1	0.0	0.0
Effective Tax Rate (%)	2.2	(0.0)	0.0	0.0
NWC / Total Assets (%)	57.1	53.1	60.5	68.6
Inventory Turnover (days)	157	147	121	118
Receivables (days)	76	72	80	80
Payables (days)	146	142	114	112
Net D/E Ratio (x)	(2.0)	1.7	0.9	0.5
Return/Profitability Ratios (%)				
Recurring Net Income Margins	(4.2)	2.8	7.5	10.1
RoCE	16.9	19.1	25.2	31.3
RoNW	7.9	15.1	34.6	40.0
Dividend Payout Ratio	0.0	0.0	0.0	0.0
Dividend Yield	0.0	0.0	0.0	0.0
EBITDA Margins	13.5	13.9	13.7	13.9

Source: Company data, I-Sec research

Annexures 1

Renewable energy potential in India

Wind is an intermittent and site-specific source of energy and therefore an extensive wind resource assessment is essential for the selection of potential sites. Over a period of time, the Ministry of Power, through the National Institute of Wind Energy (NIWE), has installed 993 wind-monitoring stations all over the country as of 31st Dec'22 and issued wind potential maps at 50m, 80m, 100m and 120m above ground level. The latest assessment indicates gross wind power potential of 695.5GW in the country at 120m above ground level.

Table 21: State-wise wind potential (MW)

States	Wind power @120m	Small Hydro	Biomass	Solar	Other	Total
Andhra Pradesh	74,906	409	578	38440	423	114,756
Arunachal Pradesh	274	2065	8	8650	0	10,997
Assam	246	202	212	13760	8	14,428
Bihar	3650	527	619	11200	373	16,369
Chhattisgarh	348	1098	236	18270	24	19,976
Goa	8	5	26	880	0	919
Gujarat	142,560	202	1221	35770	462	180,215
Haryana	419	107	1333	4560	374	6793
Himachal Pradesh	151	3460	142	33840	2	37595
Jammu & Kashmir	3	1707	43	111050	0	112,803
Jharkhand	0	228	90	18180	10	180508
Karnataka	24,155	3726	1131	24700	100450	154162
Kerala	2311	647	1044	6110	36	10148
Madhya Pradesh	15404	820	1364	61660	78	79326
Maharashtra	98213	786	1887	64320	1537	166743
Manipur	0	100	13	10630	2	10745
Meghalaya	1	230	11	5860	2	6104
Mizoram	0	169	1	9090	2	9262
Nagaland	0	182	10	7290	0	7482
Odisha	8346	286	246	25780	22	34680
Punjab	278	578	3172	2810	345	7183
Rajasthan	127,756	52	1039	142310	62	271219
Sikkim	0	267	2	4940	0	5209
Tamil Nadu	68,750	604	1070	17670	601	88695
Telangana	24,835	102		20410	0	45347
Tripura	0	47	3	2080	2	2132
Uttar Pradesh	101	461	1617	22830	1426	26435
Uttarakhand	54	1664	24	16800	5	18547
West Bengal	1050	392	396	6260	148	8246
Andaman & Nicobar	1277	7		0	0	1284
Chandigarh	0			0	6	6
Dadra & Nagar Haveli	0			0	0	0
Daman & Diu	0			0	0	0
Delhi	0			2050	131	2181
Lakshadweep	31			0	0	31
Puducherry	382			0	3	385
Others$				790	1022	1812
All India Total	**695,509**	**21,134**	**17,538**	**748,990**	**7556**	**1,490,727**

Source: I-Sec research, SECI

Annexure 2: India captive generation and consumption

Table 22: Non-utility generation capacity (GW)

GW	Thermal				Hydro	RES	Total
	Steam	Diesel	Gas	Total			
FY12	22.6	10.0	5.9	38.5	0.0	0.9	39.4
FY13	23.9	11.1	4.5	39.5	0.1	1.1	40.7
FY14	24.8	11.4	4.8	40.9	0.1	1.3	42.3
FY15	26.1	12.0	5.2	43.3	0.1	1.3	44.7
FY16	28.7	12.3	5.8	46.9	0.1	1.4	48.3
FY17	30.6	13.4	6.1	50.0	0.1	1.4	51.5
FY18	32.9	13.1	7.2	53.2	0.1	1.7	54.9
FY19	47.7	15.6	8.8	72.0	0.1	3.1	75.2
FY20	51.5	12.8	7.3	71.6	0.1	4.5	76.2
FY21	47.8	17.6	7.4	72.7	0.1	5.7	78.5
FY22	51.0	17.7	7.4	76.1	0.1	6.5	82.7
10 year CAGR	**8.5%**	**5.9%**	**2.3%**	**7.1%**	**10.9%**	**22.2%**	**7.7%**

Source: I-Sec research, Energy Statistics India

Table 23: Non-utility generation capacity (BU)

Year	Thermal				Hydro	RES	Total
	Steam	Diesel	Gas	Total			
2012-13	113	8	21	142	0.1	1.8	144
2013-14	118	9	20	147	0.1	1.9	149
2014-15	128	10	21	159	0.1	2.7	162
2015-16	137	8	21	166	0.1	2.0	168
2016-17	138	9	23	170	0.1	2.3	172
2017-18	144	8	25	177	0.1	2.3	180
2018-19	184	5	20	209	0.3	3.7	213
2019-20	206	2	25	233	0.3	6.3	240
2020-21	193	3	22	217	0.3	7.2	225
2021-22 (P)	204	2	20	226	0.4	8.5	235
	6.8%	-14.1%	-0.4%	5.3%	12.8%	19.2%	5.6%

Source: I-Sec research, Energy Statistics India

Table 24: Status of recent domestic pure wind tenders

Tenders	Date of Award	Capacity awarded (MW)	Net capacity (MW)	Commissioned (MW)	Yet to commission (MW)	Agency	Tariff (Rs/unit)
SECI-I	Feb-17	1,050	1,000	1,000	-	Central	3.46
SECI-II	Oct-17	1,000	980	760	220	Central	2.64
Tamil Nadu	May-17	450	450	50	401	State	3.42
Gujarat (GUVNL)	Jun-17	500	470	470	-	State	2.43
SECI-III	Feb-18	2,000	2,000	950	1,050	Central	2.44
Maharashtra (MSEDCL)	Mar-18	500	500	274	226	State	2.85
SECI-IV	Apr-18	2,000	2,000	722	1,278	Central	2.51
NTPC	Aug-18	1,150	-	-	-	Central	2.77
SECI-V	Sept-18	1,190	1,190	257	934	Central	2.76
SECI – VI	Dec-18	1,200	1,075	916	159	Central	2.82
SECI – VII	May-19	480	480	118	362	Central	2.79
GUVNL Ph.-II	May-19	203	203	163	40	State	2.8
SECI – VIII	Aug-19	440	440	-	440	Central	2.83
SECI IX	Aug-20	970	970	-	970	Central	2.99
SECI X	Mar-21	1,200	1,200	27	1,173	Central	2.77
SECI XI	Sept-21	1,200	1,200	-	1,200	Central	2.69
SECI XII	Jun-22	1,200	1,100	-	1,100	Central	2.89
GUVNL Ph.-III	Sept-22	1,000	1,000	-	1,000	State	2.84
SECI XIII	Dec-22	1,200	1,200	-	1,200	Central	2.9
SECI XV	May-23			**Yet to be auctioned**			
SECI XIV	Jun-23	1,240	1,240	-	1,240	Central	3.2
Total		**22,673**	**18,698**	**5,707**	**12,991**		

Source: I-Sec Research

Solar-wind hybrid power Policy

The power ministry issued its National Wind-Solar Hybrid Policy on 14th May'18. The main objective of the policy is to provide a framework for promotion of large-scale grid connected wind-solar PV hybrid systems for optimal and efficient utilisation of wind and solar resources, transmission infrastructure and land. The wind-solar PV hybrid systems will help reduce the variability in renewable power generation and achieving better grid stability. The policy also aims to encourage new technologies, methods and way-outs involving combined operation of wind and solar PV plants.

Major highlights of the policy are as under:

- A wind-solar plant will be recognised as a hybrid plant if the rated power capacity of one resource is at least 25% of the rated power capacity of the other resource.
- Both AC and DC integration of wind-solar hybrid project are allowed.
- The power procured from the hybrid project may be used for fulfilment of solar RPO and non-solar RPO in the proportion of rated capacity of solar and wind power in the hybrid plant respectively.
- Existing wind or solar power projects, willing to install solar PV plant or wind turbine generators (WTGs) respectively, to avail benefit of hybrid project, may be allowed.
- All fiscal and financial incentives available to wind and solar power projects will also be made available to hybrid projects.
- The Central Electricity Authority (CEA) and Central Electricity Regulatory Commission (CERC) shall formulate necessary standards and regulations including metering methodology and standards, forecasting and scheduling regulations, REC mechanism, grant of connectivity and sharing of transmission lines, etc., for wind-solar hybrid systems.
- Storage may be added to the hybrid project to ensure availability of firm power for a particular period.

Table 25: Solar-Wind hybrid project status

Bid	Capacity Awarded (MW)	Commissioned (MW)	Tariff (Rs/unit)
SECI Hybrid – I	840	840	2.67
SECI Hybrid -II	600	600	2.69
SECI Hybrid -III	1110	0	2.41
SECI Hybrid -IV	1200	0	2.34
MSEDCL Maharashtra	500	0	2.62
SECI Hybrid -V	1170	0	2.53
SECI Hybrid -VI	1200	0	4.65
Total	**6620**	**1440**	

Source: I-Sec research

Annexure 3: Trends in turbine nameplate capacity, hub height, and rotor diameter

Table 26: Trends from US onshore markets

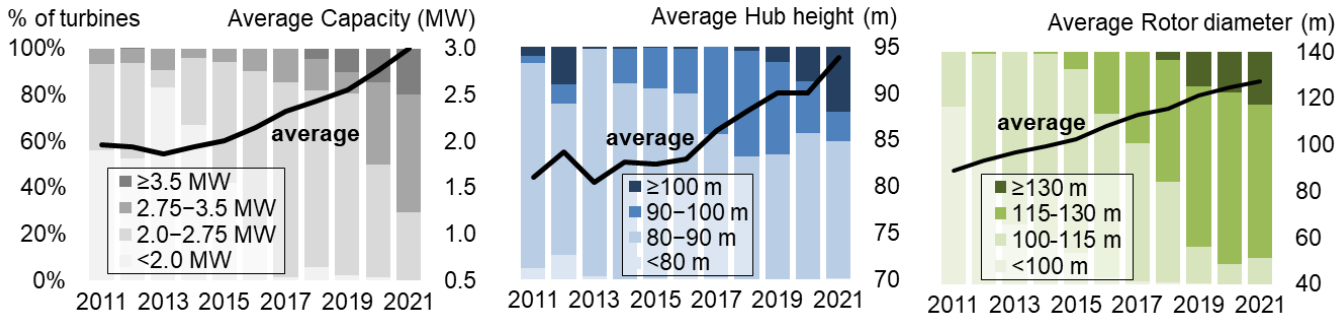
Capacity	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<2.0MW	56%	53%	83%	67%	42%	22%	1%	6%	2%	1%	0%
2.0 - 2.75 MW	37%	41%	7%	29%	52%	68%	84%	76%	78%	48%	29%
2.75 - 3.5 MW	7%	6%	9%	4%	6%	10%	15%	14%	9%	35%	51%
≥ 3.5 MW	0%	0%	0%	0%	0%	0%	0%	4%	10%	15%	20%
Average	**1.97**	**1.95**	**1.86**	**1.94**	**2.01**	**2.15**	**2.32**	**2.43**	**2.55**	**2.76**	**3.00**

Hub Height	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<80 m	5%	11%	1%	0%	1%	1%	1%	0%	0%	0%	0%
80-90 m	88%	65%	98%	84%	82%	79%	62%	53%	54%	63%	59%
90-100 m	3%	8%	0%	15%	18%	19%	37%	45%	40%	22%	13%
≥100m	4%	16%	1%	1%	0%	1%	0%	2%	6%	15%	28%
Average	**81.0**	**83.8**	**80.5**	**82.7**	**82.4**	**83.0**	**86.0**	**88.1**	**90.1**	**90.1**	**93.9**

Rotor Diameter	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<100m	77%	53%	26%	20%	14%	3%	1%	1%	0%	0%	0%
100-115 m	23%	47%	74%	80%	79%	70%	60%	43%	16%	9%	11%
115-130 m	0%	1%	0%	1%	7%	27%	39%	53%	69%	74%	66%
≥130m	0%	0%	0%	0%	0%	0%	0%	3%	15%	17%	23%
Average	**89.0**	**93.4**	**96.9**	**99.5**	**102.4**	**108.2**	**113.0**	**115.6**	**121.2**	**124.9**	**127.5**

Source: I-Sec Research

Chart 23:Increaseing average capacity with higher turbine size in USA



Source: I-Sec research, Land based wind market (US)

Annexure 4: Details of historical equity share dilution in Suzlon

Table 27: Suzlon equity dilution

Dates	Face value	Cumulative shares (mn)	New shares	Details	Premium (Rs)	Total money raised (Rs mn)
1995-2003	10	24		Paid up capital		
Apr-04	10	27	2.6	Pre IPO Private Equity offer to Citicorp	184	499.9
4-Aug	10	29	2	Pre IPO Private Equity offer to Chryscap	234	500
4-Sep	10	87	57.9	Bonus shares	-	
5-Jun	10	261	173.8	Bonus shares	-	
5-Oct	10	287	26.7	Fresh issue in IPO	500	13617
July 06-Nov 07	10	288	0.5	Employee stock option	245	120
7-Dec	10	299	11.4	Qualified Institutional placement	1907	21827
8-Jan	2	1,497		Share split 1:5 ratio		
Feb 08- July 09	2	1,498	1.4	Employee stock option	41	59
9-Jul	2	1,556	58.4	GDR	80	4763
9-Aug	2	1,556	0	FCCB conversion	67	1
Nov 09 - April 10	2	1,556	0	Employee stock option	41	1
10-Jul	2	1,745	188.6	Right issue	61	11884
10-Nov	2	1,777	32	Issued to IDFC for its share in Seforge ltd	58	1920
Apr 13- Jan 14	2	2,303	526.1	Issued to CDR lenders	17	9738
Apr 13- Jan 14	2	2,488	184.7	Issued to promoters as per CDR	17	3419
Apr 14 - Nov 14	2	2,703	215.4	Issued to CDR lenders	17	3987
Apr 14 - Nov 14	2	2,738	34.8	Issued to promoters as per CDR	17	645
Apr 14 - Nov 14	2	2,806	67.9	issued to other person	17	1256
Apr 14 - Nov 14	2	2,849	42.9	Issued to other loans	17	795
14-May	2	2,859	10.1	Employee stock option	6	82
Sep 14 - Mar 15	2	3,707	848.4	Conversion of step up convertible bonds of S$546m	14	13117
Apr 15 -May 15	2	3,823	116	Conversion of step up convertible bonds of S$546m	14	1793
15-May	2	4,823	1,000.00	Issued to DSA	16	18000
June 15 - Feb16	2	5,020	196.8	Conversion of step up convertible bonds of S$546m	14	3043
Aug-16	2	50,244	3.9	Conversion of step up convertible bonds of S$546m	14	60
Apr-Aug 17	2	5,320	295.5	Conversion of step up convertible bonds of S$546m	14	4580
Jun-20	2	6,317	997	Debt conversion of Rs41bn	3	4637
Jun-20	2	7,713	1,397	Issued to promoters	0	3421
Jul-20	2	8,225	512	Issued to FCCB holders	5	3466
Oct-20	2	8,304	79	Conversion of restructured bonds	1	205
Nov-20	2	8,336	32	Conversion of restructured bonds	1	83
Dec-20	2	8,364	29	Conversion of restructured bonds	1	75
Feb-21	2	8,449	85	Conversion of restructured bonds	1	221
Mar-21	2	8,508	59	Conversion of restructured bonds	1	153
Dec-21	2	8,712	204	Conversion of CCDs	0	500
Aug-21	2	8,730	18	Conversion of remaining step up convertible bonds of S$546m	5	122
Apr21-Mar 22	2	9,217	487	Issued to FCCB holders	1	1272
May-22	2	9,789	571	Conversion of optionally conversion of debentures		1143
Sep-22	2	10,073	284	Conversion of restructured bonds	0	708
Jun-23	2	12,473	2,400	Rights Issue	3	12000

Source: I-Sec research

Annexure 5: Global wind installations and market share

Table 28: Global wind installations in the past

	CY12	CY13	CY14	CY15	CY16	CY17	CY18	CY19	CY20	CY21	CY22
Global Wind Installations (GW)											
China	13.2	16.1	23.4	30.5	23.3	18.5	21.2	27.0	54.4	47.6	37.6
USA	13.1	1.1	4.9	8.6	8.2	7.0	7.6	9.1	16.9	12.7	8.6
Germany	2.4	3.2	5.3	6	5.4	5.3	3.4	1.4	2.1	1.9	2.4
India	2.3	1.7	2	2.6	3.6	4.1	2.2	2.4	1.1	1.5	1.8
UK	1.9	1.9	1.7	1	0.7	.6	1.9	2.4	0.6	2.7	1.7
Italy	1.3	0.4	0.1	0.3	0.3	0.3	-	-	-	-	-
Spain	1.1	0.2	0	-	0	0.1	-	-	-	-	-
Brazil	0.9	1	2.5	2.8	2	2.0	1.9	0.7	2.3	3.8	4.1
Canada	0.9	1.6	1.9	1.5	0.7	0.3	0.6	0.6	0.2	0.7	1.0
France	0.8	0.6	1	1.1	1.6	1.7	1.6	1.3	1.3	1.2	1.6
Sweden	0.8	0.7	1.1	0.6	0.5	0.2	0.7	-	-	-	-
Australia	0.4	0.7	0.6	0.4	0.1	3.8	5.0	13.7	14.7	19.3	17.2
Rest of World	5.9	6.1	5	3.4	4	7.4	5.3	2.1	1.7	2.2	1.6
Total	43.9	33.7	49.8	59.6	51.8	53.5	51.3	60.8	95.3	93.6	77.6
Ex China	**30.7**	**17.6**	**26.4**	**29.1**	**28.5**	**35.0**	**30.1**	**33.8**	**40.9**	**46.0**	**40.0**
Cumulative (GW)											
China	75.3	91.4	114.8	145.4	168.7	87.2	208.4	235.4	289.8	337.4	375.0
USA	60	61.1	66	74.6	82.8	89.8	97.4	106.5	123.5	136.2	144.8
Germany	31.3	34.7	39.9	46	50	55.3	58.7	60.2	62.3	64.2	66.6
India	18.4	20.2	22.2	24.8	28.4	32.5	34.7	37.1	38.2	39.7	41.5
UK	8.4	10.9	12.6	13.6	14.3	16.9	18.8	21.2	21.8	24.5	26.2
Italy	8.1	8.6	8.7	9	9	9.3	9.3	9.3	9.3	9.3	9.3
Spain	22.8	23	23	23	23	23.1	23.1	23.1	23.1	23.1	23.1
Brazil	2.5	3.5	6	8.7	8.7	10.7	12.7	13.4	15.7	19.5	23.6
Canada	6.2	7.8	9.7	11.2	11.9	12.2	12.8	13.4	13.6	14.2	15.3
France	7.6	8.3	9.3	10.4	11.9	13.6	15.2	16.5	17.8	19.0	20.6
Sweden	3.7	4.5	5.4	6	6	6.2	6.9	6.9	6.9	6.9	6.9
Australia	2.6	3.2	3.8	4.2	4.3	8.1	13.1	26.7	41.4	60.7	77.9
Rest of World	38.3	44.4	52.2	60.2	72	79.4	84.8	86.9	88.6	90.8	92.3
Total	**281.5**	**315.2**	**365.0**	**424.6**	**476.4**	**521.8**	**573.1**	**633.9**	**729.2**	**822.8**	**900.4**
Ex China	**207.5**	**226.7**	**254.8**	**287.3**	**318.1**	334.6	364.7	398.5	439.4	485.4	525.4

Source: I-Sec research

Table 29: Make-wise installations

	CY12	CY13	CY14	CY15	CY16	CY17	CY18	CY19	CY20	CY21	CY22
Vestas	14.0%	13.1%	10.1%	12.0%	16.8%	15.7%	21.6%	17.6%	13.8%	19.6%	15.1%
Goldwind	6.0%	11.0%	9.2%	12.8%	12.4%	11.0%	14.2%	14.0%	14.6%	13.5%	18.0%
Siemens	9.5%	7.4%	10.8%	5.0%	4.1%	13.9%	8.7%	10.1%	6.5%	11.3%	7.8%
GE	15.5%	6.6%	10.2%	9.2%	12.6%	10.0%	10.6%	12.8%	15.3%	11.4%	12.8%
Mingyang	2.7%	3.5%	4.0%	3.8%	3.8%	0.0%	5.2%	7.2%	6.3%	7.9%	7.8%
Nordex	NA	3.3%	2.9%	2.7%	5.2%	0.0%	5.2%	3.6%	3.1%	11.3%	6.8%
GW											
Vestas	6.1	4.4	5.0	7.2	8.7	8.4	11.1	10.7	13.1	18.3	11.7
Goldwind	2.6	3.7	4.6	7.6	6.4	5.9	7.3	8.5	13.9	12.7	14.0
Siemens	4.2	2.5	5.4	3.0	2.1	7.4	4.5	6.1	6.2	10.6	6.1
GE	6.8	2.2	5.1	5.5	6.5	5.3	5.4	7.8	14.6	10.7	9.9
Mingyang	1.2	1.2	2.0	2.3	2.0	-	2.7	4.4	6.0	7.4	6.1
Nordex		1.1	1.4	1.6	2.7	-	2.7	2.2	2.9	10.6	5.3

Source: I-Sec research

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