

Industry seeks recipe for success

Enticed by rapid growth prospects, wind turbine suppliers are targeting India with an array of products tailored to the country's demanding climate and tougher incentive regime.

Eric Prideaux examines the challenges they face and the technology on offer

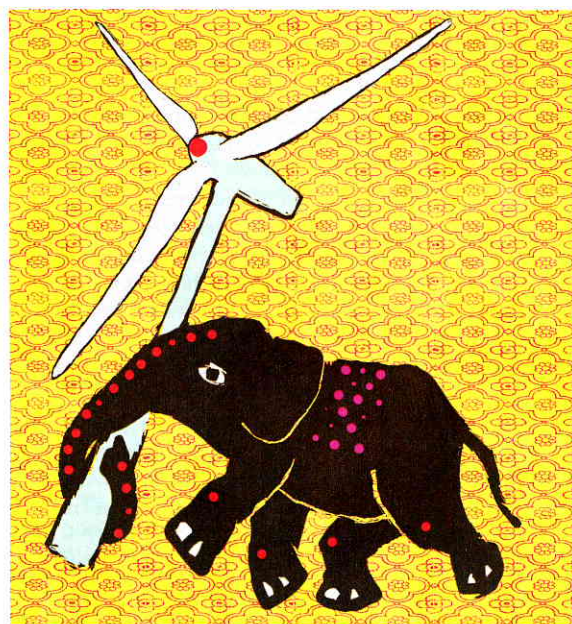
Wind turbine suppliers are upping the ante in India. Growth of nearly 20% in turbine installations last year boosted the country to third position worldwide for new wind power capacity, after China and the US. The government wants to help meet soaring electricity demand with total capacity of almost 25GW of wind by 2022 — the wind sector itself targets twice that — and suppliers are building factories and research facilities to answer the call.

Doing business in India means interpreting monsoon clouds: firms are working out whether big regulatory changes under way will result in opportunities or just red tape. The government is phasing out a tax-based incentive scheme said to have encouraged many projects without proper wind measurements behind them and in areas with poor wind resources. Taking its place is the generation-based incentive (GBI) aimed at preventing inefficient wind farms and encouraging more productive — and therefore profitable — ones.

This puts a premium on technology. "The need of the hour is to look at the generation itself — customers are looking at the cost per kilowatt hour that these machines generate," said Venkatachalam Ayyar, chief operating officer of turbine supplier and independent power producer RRB Energy at the Wind Power India 2011 conference in the south-eastern industrial city of Chennai in April. Paulo Soares, chief executive of turbine maker Kenersys Group, agreed. "Customers in India today look for 16% IRR [internal rate of return] on their money," he said. "And those with the best site, with the best turbine — they'll get the best return."

Professional approach

Ramesh Kymal, managing director of turbine supplier Gamesa India, is confident tougher policy will sort out kinks in India's incentive system. Until now, backers of wind have largely been manufacturers generating power for their own use, as well as wealthy investors



ERIC PRIDEAUX

more interested in claiming 80% accelerated depreciation on taxable income than in long-term project viability.

Under the new system, in addition to the GBI, wind farm owners will benefit from renewable-energy certificates that began trading on an exchange in March. Prices can fluctuate between INR 1.5 (\$0.03) and INR 3.9 (\$0.09) per kilowatt hour of wind power sold.

The GBI provides, in addition to each state's feed-in tariff, an incentive tariff of INR 0.5/kWh to eligible projects for up to ten years and is subject to a cap of INR 6.2 million (\$137,472) per installed megawatt of capacity. Combined with the green certificates, this adds up to a reasonable return on investment, Kymal said at the conference. This, in turn, should have knock-on effects across the sector.

"Wind research will be more scientific. The legal framework will be more scientific. In short, it will become a professional market, because the seller and buyer will be completely professional," Kymal added. The prognosis is already proving accurate, and to Gamesa's benefit. Not long after the conference, Gamesa

(CONTINUED)

announced an agreement with independent power producer (IPP) Caparo Energy India to deliver 2GW of wind power capacity over the next five years. Gamesa calls it the largest such deal ever in India.

So far, the main companies to have installed turbines in India are home-grown Suzlon, with a market share of 42%, Enercon-India (19%), Vestas (9.1%) and Gamesa (5.3%), according to BTM Consult. Some international companies with Indian subsidiaries are procuring more than 80% of their components in India. There are 17 wind technology manufacturers with combined annual production capacity of 7.5GW. According to the World Institute of Sustainable Energy, an Indian renewables think tank, this could rise to 17GW over the next two years as new players enter the fray.

The Global Wind Energy Council notes that low wind regimes such as India's require manufacturers to slash costs by "designing down" turbines for lower fatigue load than those intended for windier areas, while keeping components to a bare minimum. Wind companies can also maximise power capture with tall towers, large rotor diameters and machines designed to operate efficiently at partial loads.

Suppliers have already introduced several models for low- and medium-speed wind regimes (see table). Eager to maintain its lead in the Indian market, Suzlon in April unveiled a new suite of wind turbines it calls well-adapted to the country's climate — an assertion made by every main player in India.

Suzlon says its S9X 2MW machine has improved compatibility with the power grid to meet recently tightened-up requirements. One year ago, the government introduced the Indian Electricity Grid Code, creating a unified set of technical and commercial rules to which all utilities using the grid must adhere. Suzlon says its new turbine complies with low-voltage ride-through stipulations demanding that units stay connected to the grid during momentary plunges in voltage.

Improved pitch and yaw systems also boost reliability, says the company. Meanwhile, amid complaints by analysts that too many turbines — by any supplier — are erected in areas with patchy wind conditions, Suzlon points to more than 475 weather stations across 13 states.

Stiff competition

Insiders say Suzlon can expect stiff competition from Danish rival Vestas, which has several years' experience

TAILORED TO INDIA

Sample of turbines for low and medium wind speeds

Supplier	Capacity (MW)	Wind class*
GE Wind	1.5	IIA
Kenersys India	2	IIA
ReGen Powertech	1.5	IIIA
RRB Energy	1.8	II/III
Suzlon	1.25	II
Suzlon	1.5	IIIA
Suzlon	2.1	IIA
Vestas India	1.65/1.8	IIB/IIIA

*International Electrotechnical Commission standards for average annual wind speeds. Class I: 10 m/s; II: 8.5 m/s; III: 7.5 m/s; IV: 6 m/s. A and B denote high or low turbulence intensity, respectively.

Source: GWEC

in India. "Our ambitions for India are sizeable, to say the least," Rajiv Wahi, executive chairman of Vestas Wind Technology India, said at the conference. The company has operated in India for more than a decade and has installed over 2.4GW across such windy states as Tamil Nadu, Maharashtra, Karnataka, Gujarat, Kerala and Rajasthan. It has factories in a cluster of wind-rich sites in the south. It also has a research and development centre in Chennai employing more than 300 specialists.

Wahi pointed out that Vestas has already marketed turbine models in India able to operate in low wind speeds. Further tweaking for the Indian market is in the works. "Going forward, Vestas' plan is to have market-specific products," he said.

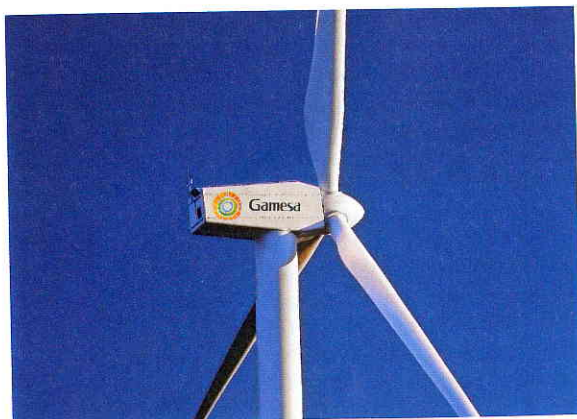
Nearly all low and medium wind turbines marketed in India have rated capacity greater than 1MW. But Gamesa managing director Ramesh Kymal said: "Bigger, bigger does not necessarily equal better, better... I'm very loath to bring in larger capacity turbines, especially in a country like India where the infrastructure is so poor.

"Let's not forget that it's not enough to put up a turbine," he continued. "You need to service it, which means you need the bigger cranes." Kymal said the main criterion for choosing a turbine should be low cost per kilowatt hour of power produced — the main factor sophisticated IPPs are considering as they size up the Indian market.

According to Gamesa, the estimated price of power from its G58 850kW wind turbine is about INR 1.8/kWh, compared with between INR 1.82-1.98/kWh among its rivals. Gamesa is trying to further improve its value for money by procuring as many components as possible in India.

Gamesa's small-is-beautiful strategy has some risks, however. "All my competitors are heading towards megawatt-class turbines," acknowledged Kymal. "There's a fair amount of sentiment attached: when you go to an IPP customer, they're used to megawatt-class turbines, worldwide. When you offer them an 850kW, sometimes you get rejected straight away."

Kymal got around the problem by asking his product team to adapt a 2MW turbine to Indian conditions by equipping it with a larger rotor diameter. "We can be quite sure that this price will be equal to my 850kW," he said. "I



Small is beautiful...
Gamesa believes its G58 850kW turbine is ideally suited for the Indian market

won't discontinue the 850kW, because I think it is relevant not only to India but to every developing market in the world — whether it's Africa or South America. I could probably make India the base for manufacturing it."

Whether or not that happens, Gamesa in March announced a €60 million plan to double its manufacturing capacity in India by 2012 — part of an aim to boost its share of the Indian market by 166% over the next three years. A new factory in the north-western state of Gujarat will manufacture blades for its 650kW turbine. Production of the G9X 2MW will begin there next year. Gamesa has also opened a research and development facility in Sholinganullar, Chennai.

New entrant

Germany-based wind turbine manufacturer Kenersys today commands less than 1% of Indian market share, but it is taking on its larger rivals with gusto: it targets double-digit market share by 2014. Founded originally as a wind design and engineering firm in 2003, the company was acquired in 2007 by Indian industrial giant the Kalyani Group. Today, with 250 employees in India and 100 in Europe, Kenersys also has the backing of energy-sector private equity firm First Reserve.

Kenersys' strategy is to look beyond the immediate horizon. "We meet all the stringent grid code requirements floated by CWET's new Indian grid code to be enforced on January 1, 2012," said Venkatesh Babu, associate vice-president of business development at Kenersys India. He was referring to the Centre for Wind Energy Technology, based in Chennai, a testing and certification arm of the Ministry of New and Renewable Energy.

"Our turbines are well equipped to fulfill all the stringent grid codes — not only the present capacities of 2MW and 2.5MW but we are also designing the K110 2.2MW to be launched next year," he said. The 2.5MW turbine, announced at the Chennai event, has rotor diameter of 100 metres and has one of the largest rated capacities of wind turbines in India.

Kenersys says its most important selling point in the Indian market is patented technology for dealing with the more than 1,200 transient grid faults that plague the country every year. These brief power failures, usually lasting between five to seven minutes, can reduce efficiency for unprotected turbines as machines struggle to adjust to new wind conditions once power is restored. Also, fatigue can increase during outages, since no power is available to rotate blades out of the wind.

Kenersys incorporates an internal power supply unit supplying constant voltage for pitching and yawing. "So when the grid trips, your turbine is still kept live," said Babu. "The moment the grid restores power, you'll immediately start generating active kilowatt hours and export back to the grid." The technology also reduces the likelihood that cyclones will uproot the turbines.

Keeping it simple

Siemens is playing catch up in India with established rivals Suzlon and Vestas. But not for lack of interest. "India is indicated as a key market for us," said Bernhard Telgmann, who heads Siemens' Asia-Pacific wind operations. The company sells its 2.3MW turbine

...or bigger is better? Newcomer Kenersys hopes to increase its market share with machines such as these K82 2MW units in Maharashtra



and is building a factory in Gujarat state. It is also investing in a research-and-development centre.

Telgmann harbours no doubts about market potential. "India has all the ingredients it takes to be successful in wind. That is what we have learned over the last year as we have gone in more deeply," he said.

When it comes to the blades that harness the energy from Indian wind, supplier LM Wind Power in 2010 commanded 28% of the market. The company sees its Indian activities as part of a larger push into emerging markets worldwide.

Last year it built 2.3GW of production capacity in China, rolling out its first blades six months after breaking ground at one plant. "It's a bit difficult to do that in India," said Ian Telford, vice president of sales and marketing. Still, the company is adding 500MW of capacity to its facilities at Dabaspet, Karnataka — its second plant in India — and Telford said the company is "pretty confident" it will build a plant in the north-west next year, and possibly another plant soon after that.

LM's Indian strategy is to provide blades suited to relatively slow winds. "There's so much demand for longer, lighter blades," he continued. He again invoked the example of China. Whereas rotors with 40.3-metre blades were standard for 1.5MW turbines for moderately slow Class-III Chinese wind sites, developers are scaling up diameters. LM's new 42.1-metre blades for Class-III wind produce 4-5% more energy over the lifetime of the turbine, producing savings equivalent to the price of the blades, said Telford.

Despite all the activity, several India watchers seem concerned that the government, despite the welcome introduction of the new incentives scheme, may fail to get it right. On one hand, Kenersys' Soares much prefers India's free-market business environment to the more controlled variety in China, where he was CEO of Suzlon Energy (Tianjin). "After the long experience I had in China, I can only say that dealing with India is refreshing, to say the least."

Yet many observers are wary of a lack of cohesion in Indian wind policy seen, for example, in state-by-state approaches to tariffs. And the industry is frazzled by a nationwide patchwork of regulations from several agencies. Echoing Soares, Telgmann warned against fixing regulations with more regulations. "My recommendation is: make it simple," he said. "Then there will be no end for growth." ■■W