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The Ascent of Wind Power

By [KEITH BRADSHER](#)

KHORI, [India](#) — Dilip Pantosh Patil uses an ox-drawn wooden plow to till the same land as his father, grandfather and great-grandfather. But now he has a new neighbor: a shiny white wind turbine taller than a 20-story building, generating electricity at the edge of his bean field.

Wind power may still have an image as something of a plaything of environmentalists more concerned with clean energy than saving money. But it is quickly emerging as a serious alternative not just in affluent areas of the world but in fast-growing countries like India and [China](#) that are avidly seeking new energy sources. And leading the charge here in west-central India and elsewhere is an unlikely champion, Suzlon Energy, a homegrown Indian company.

Suzlon already dominates the Indian market and is now expanding rapidly abroad, having erected factories in locations as far away as Pipestone, Minn., and Tianjin, China. Four-fifths of the orders in Suzlon's packed book now come from outside India.

Not even on the list of the world's top 10 wind-turbine manufacturers as recently as 2002, Suzlon passed Siemens of Germany last year to become the fifth-largest producer by installed megawatts of capacity. It still trails the market leader, Vestas Wind Systems of Denmark, as well as [General Electric](#), Enercon of Germany and Gamesa Tecnológica of Spain.

Suzlon's past shows how a company can prosper by tackling the special needs of a developing country. Its present suggests a way of serving expanding energy needs without relying quite so much on coal, the fastest-growth fossil fuel now but also the most polluting.

And Suzlon's future is likely to be a case study of how a manufacturer copes with China, both in capturing sales there and in confronting competition from Chinese companies.

Suzlon is an outgrowth in many ways of India's dysfunctional power- distribution system. Electricity boards owned by state governments charge industrial users more than twice as much for each kilowatt-hour as such customers pay in the United States — and they still suffer blackouts almost every day, especially in northern India.

Subject to political pressures, the boards are often slow to collect payments from residential consumers and well-connected businesses, especially before elections. As a result, they often lack the money to invest in new equipment.

To stay open and prevent crucial industrial or computer processes from stopping, a wide range of businesses — including auto parts factories and outsourcing giants — rely on still more costly diesel generators.

With natural gas prices climbing as well, wind turbines have become attractive to Indian business. The Essar Group of Mumbai, a big industrial conglomerate active in shipping, steel and construction, is now working on plans for a wind farm near Chennai, formerly Madras, after concluding that regulatory changes in India have made it financially attractive.

“The mechanisms didn’t used to be there; now they are,” said Jose Numpeli, vice president for operations at Essar Power. The electricity boards “know how to cost it, they know how to pay for it.”

Roughly 70 percent of the demand for wind turbines in India comes from industrial users seeking alternatives to relying on the grid, said Tulsi R. Tanti, Suzlon’s managing director. The rest of the purchases are made by a small group of wealthy families in India, for whom the tax breaks for wind turbines are attractive.

Wind will remain competitive as long as the price of crude oil remains above \$40 a barrel, Mr. Tanti estimated. To remain cost-effective below \$40 a barrel, wind energy may require subsidies, or possibly carbon-based taxes on oil and other fossil fuels.

Mr. Tanti and his three younger brothers were running a textile business in Gujarat, in northwestern India, when they purchased a German wind turbine — only to find that they could not keep it running. So they decided to build and maintain turbines themselves, starting Suzlon in 1995 and later leaving the textile business.

To minimize land costs, wind farms are typically in rural areas, chosen for the strength of the wind there as well as low prices for land. But that can mean culture shock.

“There were no big changes until the turbines came,” Mr. Patil said, pausing from plowing here with his father in this remote, hilly, tribal area 200 miles northeast of Mumbai, where oxen remain at the center of farm life and motorized vehicles are uncommon.

Doing business in rural areas of the developing world carries special challenges. The new Suzlon Energy wind farm in Khori is a subject of national pride. More than 300 giant wind turbines, with 110-foot blades, snatch electricity from the air. But it has also struggled with the sporadic lawlessness that bedevils India.

S. Mohammed Farook, the installation's manager, was far from happy one recent afternoon. At least 63 new turbines, worth \$1.3 million apiece and each capable of lighting several thousand homes when the wind blows, could not be put into service because thieves had stolen their copper power cables and aluminum service ladders for sale as scrap.

The copper or aluminum fetches as little as \$1 from black-market scrap dealers. But each repair costs thousands of dollars in parts and staff time, in a country that is desperately short of electricity and technicians.

"I am crying inside," Mr. Farook said.

Despite such problems, Suzlon has expanded rapidly as global demand for wind energy has taken off. Its sales and earnings tripled in the quarter ended June 30, as the company earned the equivalent of \$41.6 million on sales of \$202.4 million.

The demand for wind turbines has particularly accelerated in India, where installations rose nearly 48 percent last year, and in China, where they rose 65 percent, although from a lower base. Wind farms are starting to dot the coastline of east-central China and the southern tip of India, as well as scattered mesas and hills across central India and even Inner Mongolia.

Coal is the main alternative in the two countries, and is causing acid rain and respiratory ailments while contributing to [global warming](#). China accounted for 79 percent of the world's growth in coal consumption last year and India used 7 percent more, according to statistics from [BP](#).

Worried by its reliance on coal, China has imposed a requirement that power companies generate a fifth of their electricity from renewable sources by 2020. This target calls for expanding wind power almost as much as nuclear energy over the next 15 years. India already leads China in wind power and is quickly building more wind turbines.

Chinese and Indian officials are optimistic about relying much more heavily on wind.

"I believe we may break through these targets — if not, we should at least have no problem reaching them," said Zhang Yuan, vice general manager of the China Longyuan Electric Power Group, the renewable-energy arm of one of China's five state-owned electric utilities, China Guodian.

Kamal Nath, India's minister of commerce and industry, was even more enthusiastic. "India is ideally suited for wind energy," he said. "The cost of it works well and we have the manufacturing capability."

International experts are more skeptical that wind will displace coal to a considerable extent, saying that while electricity production from wind is likely to increase rapidly, the sheer scale of energy demands suggests that coal burning will expand even more.

Suzlon still sees plenty of opportunity in China and has decided to build some of its latest designs in China for the market there, despite the risk of having them copied by Chinese manufacturers.

“Being an Asian leader,” Mr. Tanti said, “we cannot afford to ignore China.”

A dozen Chinese manufacturers have jumped into wind-turbine manufacturing as well. They have struggled with quality problems and have limited production capacity so far, resulting in long delivery delays.

But the Chinese producers already have an edge on price over imported equipment, according to Meiya Power of Hong Kong, which owns and operates power plants in China and across Asia, and is considering a wind farm in windswept Inner Mongolia.

Mr. Tanti said that rapid innovation and design changes would allow Suzlon to stay ahead of copycats. “It’s a time-consuming process,” he said, estimating that it would take two to three years for rivals to clone Suzlon turbines because they use unique or proprietary parts.

Suzlon manufactures its turbines at two factories in India, but has begun test production at a just-completed turbine-blade factory in Minnesota, where it already supplies turbines for a wind farm operated by the Edison Mission Group and [Deere & Company](#). It has also begun test production at a Chinese factory that will make both turbines and blades.

To reach the Suzlon wind farm here, the huge rotors travel by night on special trucks for a 300-mile journey from northwestern India on a succession of paved and dirt roads.

Squatter huts have had to be removed along the way to allow the long trucks to turn; Suzlon is not required to pay compensation but often makes donations in these cases, Mr. Farook said.

The truck crews also carry wooden poles to prop up electricity wires across the road and pass underneath. The trucks sometimes attract gawkers, and live wires occasionally burn bystanders.

“With human error, it may touch human flesh,” Mr. Farook said. “In that case, we have to pay compensation.”

Villagers in Khori said that thievery and even robberies by rock-throwing gangs were nothing new, and were a problem long before Suzlon began setting up wind turbines. The company’s response — stepping up patrols by security guards — has reduced everyday crime. That has made villagers more willing to rent land at the edge of their fields for the turbines.

At first, “we were really confused about what was going on,” Mr. Patil said. “But now we’re O.K. on it.”

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