

THE WALL STREET JOURNAL

CURRENT AFFAIRS

Alternative Energy Hurt By a Windmill Shortage

While Projects in U.S. Stall, Europe's Utilities Expand Their Reach

By **KEITH JOHNSON**
July 9, 2007; Page A1

The race to build new sources of alternative energy from the wind is running into a formidable obstacle: not enough windmills.

In recent years, improved technology has made it possible to build bigger, more efficient windmills. That, combined with surging political support for renewable energy, has driven up demand. Now, makers can't keep up -- mostly because they can't get the parts they need fast enough.

POWER SPIN

- **The Situation:** Interest in renewable energy, such as wind power, is surging, but the makers of wind-turbine parts can't keep up with demand.
- **The Background:** The U.S. lags other countries in wind-turbine capacity, and government support has been inconsistent.
- **What's Ahead:** Foreign players are moving into the U.S. market, with acquisitions and wind-farm projects.

Numerous wind-power projects from Virginia to California have been stalled due to the shortage. But for some renewable-energy companies in Europe, where wind power has been in vogue for almost two decades, the logjam is a lucrative opportunity. These firms anticipated a shortage of turbines and locked in orders with makers. They're now using their considerable buying power to gobble up smaller utilities in the U.S. that couldn't otherwise get their hands on turbines.

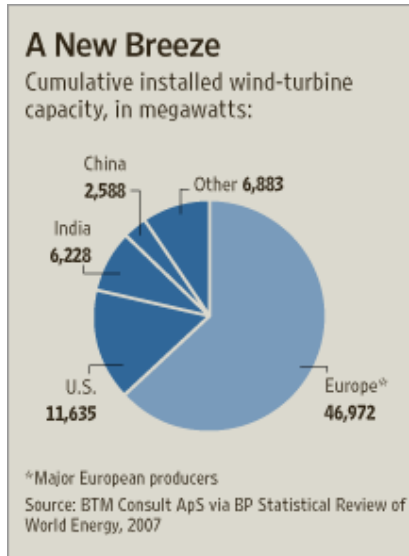
That was the case with Community Energy Inc., a company in Wayne, Pa. After trying for years to kick-start wind-power projects in the U.S., the company had built only two small wind farms; a third sat idle. Brent Alderfer, the founder and chief executive, said he had few problems acquiring the necessary permits and funding. But when it came to getting windmills, he faced a multiyear delay.

"We were like an airline sitting there and being told we had to wait three years to get our airplanes," he says.

In late 2005, Mr. Alderfer contacted Iberdrola SA, a Madrid-based utility that has emerged as one of the world's leaders in renewable energy. Six months later, Iberdrola purchased Community Energy for \$40 million. Two months after that, technicians had

outfitted the company's stillborn project with gleaming white turbines that started churning out enough clean electricity for about 6,500 homes.

"We couldn't have done this on our own -- not then, not in five years' time," says Mr. Alderfer.



Modern wind turbines are astonishingly complicated machines, containing more than 8,000 components and requiring special transformers to turn their spinning blades into electricity. Though commonly called windmills, they're technically wind turbines. Manufacturers depend on a network of component suppliers that, in turn, need years to ramp up production. That's created a bottleneck for the turbine makers.

Iberdrola's strategic advantage stems in part from a €3 billion, or \$4.09 billion, bet it made last year to lock up most of the order book of Spanish turbine maker Gamesa SA -- the world's second largest -- through 2009. Iberdrola also holds a 24% equity stake in Gamesa.

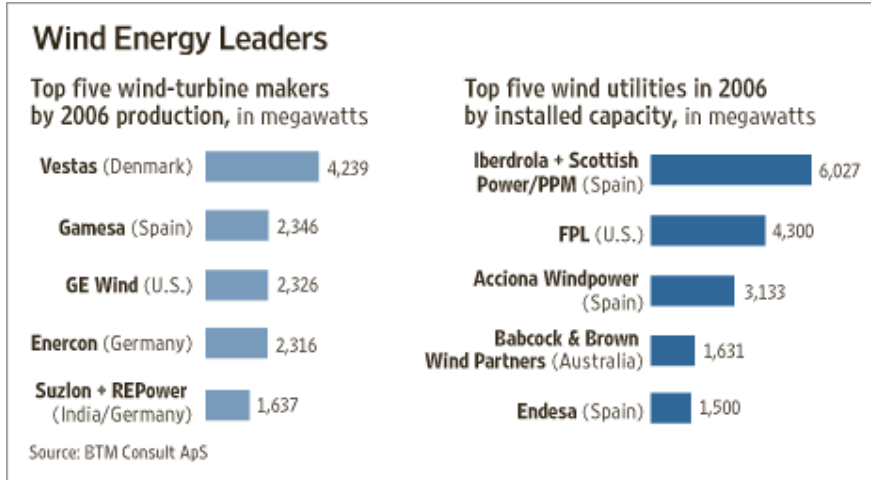
In addition to Community Energy, Iberdrola snapped up two other small U.S. developers last year in Iowa and Virginia, both of which lacked the funding and the turbines to get going. Last month, it entered into a deal to buy its first regulated U.S. utility company, Energy East Corp., of Portland, Maine, for \$4.58 billion, in part to take advantage of U.S. tax credits for wind.

Though still a relatively small force on the U.S. energy grid, wind power is on the rise as oil prices and environmental concerns soar. Governments from Beijing to Sacramento are showering the sector with subsidies in an effort to boost production of clean energy and reduce emissions of greenhouse-gases like carbon dioxide. Europe now plans to produce 20% of its energy from renewable sources by 2020, up from about 6% today, with wind power playing the leading role.

In the U.S., more wind power was installed last year than in any country in the world - 2,454 megawatts, or more than the equivalent of two nuclear reactors. Despite the recent action, the U.S. still lags behind other countries that have spent decades nurturing wind power with subsidies and price supports. Germany has fewer wind resources -- breezy, wide-open spaces -- than the state of North Dakota, for instance, but has twice as much wind power as the entire U.S. Spain, with one-seventh the population of the U.S., has the same amount of wind power. Overall, only about 1% of power in the U.S. comes from wind.

The turbine shortage could have a significant impact on how quickly the industry can continue to grow in the near term, as well as on what shape it will take in the future. Just five manufacturers produce more than 80% of the world's wind turbines. A midsize, 1.5-megawatt turbine costs about \$1.2 million.

Miguel Salis, the head of the Madrid-based Eolia, a fund that supplies financing and development know-how to small wind-farm developers, says, "The biggest restriction right now to wind power's growth -- everywhere, not just in the U.S. -- is the lack of turbines." He says that so many developers have "projects under way but can't get them completed, often because the turbine makers don't give them the time of day."



Makers need thousands of specially crafted parts, including gearboxes, blades and bearings, to build a turbine. Transformers vary depending on each

country's electrical grid. And the type of turbine depends on the wind resources available: Relatively wind-poor Germany has always used larger turbines, while breezier Spain and China have based their growth on midsize turbines.

Vestas A/S of Denmark, the world's biggest turbine maker, says the supply problems are crimping its production capacity. The company produced about 880 megawatts of turbines in the first quarter, down from more than 1,000 megawatts in the fourth quarter of 2006. "We are no stronger than the last delivered component out of the 8,000 components," Ditlev Engel, Vestas chief executive told investors in May.

Turbine makers are trying to make up the difference. Vestas is hoarding components to keep production steady, at the expense of working capital. Others are buying companies that make components to bring production in-house.

Siemens Wind AG of Germany, a unit of Siemens AG, two years ago bought Winergy, the leading maker of gearboxes for turbines. Suzlon Energy Ltd. of India snapped up a series of smaller component companies. Then, last month, it paid \$1.8 billion to buy rival turbine maker REPower Systems AG of Germany, which gave it access to a new set of component suppliers.

Because wind power was basically a cottage industry until recently, it was slow to develop a large group of professional manufacturers. Some turbine manufacturers, like Siemens Wind, are offshoots of large engineering groups. General Electric Co. bought Enron's wind division when the Houston company imploded. Gamesa started life half a century ago designing propeller blades for aircraft, and still makes most of its own blades.

In the U.S., there's another potential threat to growth -- erratic government support for wind power. Even though wind power has made technical strides recently, energy firms still rely on subsidies because it costs more to generate electricity with wind

turbines than other power plants such as coal, natural gas or nuclear. Wind power requires intensive capital investment in a short period of time, and has added costs like upgrading transmission systems. According to the International Energy Agency in Paris, wind farms cost between four and 14 cents to generate a kilowatt hour; coal-fired plants cost between 2.5 and six cents.

Some 20 states now have price supports for wind-generated electricity, and there is a federal tax credit to encourage new wind-park development. But there is no federal requirement for utilities to buy green energy, as there is in the United Kingdom, Denmark and Germany. And the tax credit, started in 1992, depends on a biannual congressional approval. An effort to introduce federal support for wind power was shot down this month in the Senate.

The lack of a stable, long-term regulatory environment has created a wind-power roller coaster. Developers were never sure their projects would make economic sense a few years down the road if the regulatory climate changed. Foreign turbine manufacturers were reluctant to build factories in the U.S. Vestas scrapped plans for a U.S. factory three times because of uncertainty. This spring, it announced it would build a turbine plant in Windsor, Colo.

Today, states such as Iowa, Pennsylvania, Minnesota and Oregon have gone out of their way to lure foreign turbine makers. Suzlon is building a turbine plant in Minnesota. Siemens Wind and Acciona Energía SA of Spain both announced plans to open turbine factories in Iowa. Gamesa has three plants operating in Pennsylvania.

In a few years' time, those new factories could help ease the current bottleneck. But in the short term, the supply crunch has shaken the economics of wind power.

European utility firms, meanwhile, are buying up U.S. energy firms. They say they believe growing consensus on the need to fight climate change will lead to a more stable regulatory framework for renewable energy.

Earlier this year, Portuguese utility Energias de Portugal SA, or EDP, paid about \$2.7 billion for Horizon Wind Energy of Houston. Acciona Energia SA of Spain bought EcoEnergy LLC, a unit of the Morse Group in Freeport, Ill., last month; it plans to roll out about 1,500 megawatts of wind power in the Midwest over three years. And BP Alternative Energy, a division of U.K.-based BP PLC, snapped up Virginia-based Greenlight Energy Inc. last year for about \$100 million.

European companies are estimated to own 20% of all the wind energy in the U.S., says Emerging Energy Research, a wind-power study group based in Cambridge, Mass.

American firms are now hustling to secure their own windmills to keep pace. Invenergy LLC, based in Chicago, signed a \$1 billion deal with GE in May to get its hands on turbines to supply its ambitious development plan.

In some ways, wind power is a victim of its own success. Rising fossil-fuel prices and bigger and more sophisticated turbines have brought wind power closer than ever to being competitive on price with traditional power sources. Modern machines are 10 to

20 times the size of the windmills first installed in California in the 1980s. Bigger machines have exponentially changed the economics of wind power because they take better advantage of the wind and work more hours than the smaller, older machines.

That, in turn, has sparked a boom in demand for new wind-power projects world-wide. The U.S. has quadrupled its wind-power capacity since 2000. China, which had only 346 megawatts of wind power installed in 2000, now has 2,500 megawatts, and expects to catch up to the U.S. within three years. World-wide, wind capacity has increased from 17,800 megawatts in 2000 to 74,300 megawatts at the end of last year, according to the Global Wind Energy Council, a trade group.

Better technology and growing political support for clean energy should have made life easier for Community Energy's Mr. Alderfer. When he started his company in 1999, there were no commercial wind farms operating east of the Mississippi.

Instead, as wind power became more attractive, his job got tougher. After finishing their second wind farm, a modest 24-megawatt project in New Jersey, Community Energy executives realized that upcoming projects would have to be much larger in order to be economically feasible. Some would require as many as 100 new turbines. "The whole thing moved quickly beyond our ability to finance it," Mr. Alderfer says.

The U.S. wind industry was in one of its periodic booms. After two years with virtually no new wind power, federal tax credits were renewed for 2005 and 2006. Suddenly, wind farms were cropping up everywhere. Oil-rich but windswept Texas overtook California as the leading wind-power state.

Community Energy was trying to stay in the race. In late 2005, the company sought to outfit its latest wind farm, at Locust Ridge, Pa., but couldn't get the machines. Mr. Alderfer talked with GE, the biggest U.S. turbine maker, but was told he would have to pay deposits against delivery of turbines in 2008 or 2009. That would mean going back to Community Energy's private holders to ask them to stump up more money, which Mr. Alderfer was loath to do. Locust Ridge was put on hold again. "What are we going to do with this project?" he recalls thinking.

Then he decided to call Iberdrola, the Spanish utility. At the time, Iberdrola didn't yet have a beachhead in the U.S., and executives thought it was a potential gold mine. Wind energy in the U.S. "is like Europe was years ago," says Xavier Viteri, the 46-year-old head of Iberdrola's renewable-energy business. "There's a lot of room for development there, and there is a lot of expertise here."