

Made in China, or Made by China? Chinese Wind Turbine Manufacturers Struggle to Enter Own Market

Yingling Liu – May 19, 2006 – 10:44am

China, a country with one of the world's largest wind energy potentials, has seen tremendous growth in its wind power development in recent years. Yet Chinese manufacturers are still struggling to break into their own nation's lucrative wind turbine industry. In 2005, domestic companies accounted for only 23 percent of China's cumulative installed turbine market. The remainder of the production was dominated by foreign wind turbine giants, including Spain's Gamesa, Denmark's Vestas, and Germany's Nordex.

Since the 1990s, major European turbine manufacturers have gradually gobbled up the Chinese market with the support of low-interest loans and incentives from their governments. The sudden rise in market demand in the past three years, however, has served as a wake-up call for domestic producers, who have discovered that they lag far behind their European counterparts in both technology and scale.

The typical mainstream Chinese wind turbine has a capacity of 750 kilowatts (kW), while most European products generate more than 2,000 kW. (In 2005, REpower of Germany installed an experimental 5,000 kW turbine, currently the world's largest, at a wind farm in Germany.) Additionally, most Chinese turbines use an older "fixed pitch, constant speed" control system, compared with the more sophisticated international "variable pitch, variable speed" system.

Super-heated wind energy development in China has driven up turbine demand. As of late 2005, the country was home to 1,864 turbines, with a cumulative capacity of nearly 1,270 megawatts (MW), distributed among 61 wind farms in 15 provinces and regions. Last year alone, 592 wind turbines, capable of generating approximately 500 MW in total, were newly installed, reflecting a 254-percent growth in newly installed capacity over 2004. Demand will continue to skyrocket as the government works to meet its ambitious target of 30 gigawatts of cumulative installed turbine capacity by 2020.

The Chinese turbine industry is playing much-needed catch-up. Due to insufficient knowledge and investment and inconsistent government support, domestic turbine manufacturers have been pervasively weak in research and development. A common method for acquiring technology in recent years has been to purchase production licenses from foreign counterparts, even though most of the more accessible technologies are outdated. "This is a dead end. Most of the technology is already 10 to 15 years old," says Wang Wenqi, a senior expert in the wind industry and the former general manager of Xinjiang Tianfeng, China's biggest wind energy company. "Turbine technology is being developed so fast. We would never catch up in this way."

Another way for China to acquire technology is to set up joint ventures with international wind turbine giants. This is unlikely to happen, however, due to foreign concerns about nurturing the potential competition. In the 1990s, in a push to enter Spain's market, Vestas of Denmark formed its first joint venture with the local electric company, Gamesa. After several years, the companies split, and Gamesa and Vestas have since become major global competitors.

The more feasible alternative, says Wang, is to cooperate directly with foreign turbine designers, rather than with the large manufacturers. L'Aerodyn, an independent German company that designs turbines for medium- and small-scale European producers, recently collaborated with four leading Chinese electrical equipment makers. This is a far more practical arrangement, according to Wang: "The cost of design is only one-third of license purchase. Through joint design, we get the core technology, and we own the intellectual property rights."

GoldWind, China's largest domestic turbine manufacturer, has also chosen this route. It began working with a German design company as early as 2001, and in 2005 GoldWind accounted for nearly 90 percent of the increased domestic share in the Chinese turbine market. The manufacturer has already tested its own 1,200 kW turbine and is currently designing a 1,500 kW variable pitch model.

Experts believe the key for domestic producers is to build up their own innovation capacity. "Without your own R&D capability, you will not know what technologies you should bring in, and you will not know how to digest them even if you have brought them in, let alone make innovations based on them," explains He Dexin, president of the Chinese Wind Energy Association. He believes domestic manufacturers should stop trying to obtain core technology from overseas. "Core technology can only be generated through self-innovation efforts," he contends.

The Chinese government is likely to provide at least some financial support to local producers. Ren Dongming, Deputy Director of the Renewable Energy Development Center of the Energy Research Institute at the National Development Reform Commission, says his organization has already submitted a Public Benefits Fund (PBF) proposal to the Ministry of Finance. As with the similar System Benefits Funds that exist in some U.S. states, the PBF is designed to fund certain "public benefits" that are generally not accounted for in electricity markets. "The fund will be used to support research and development of renewable energy and assist renewable energy companies with subsidized loans and the like," Ren explains. The proposal is likely to be approved in the near term.

The maturation of China's domestic wind turbine industry is having an immediate effect on turbine prices, even though most Chinese products are currently aimed at the local market. The cost of imported wind turbines is roughly 10,000 RMB (US\$1,200) per kilowatt, while the domestic equivalent is about one-third less. Since turbines account for 60–70 percent of overall expenses for wind energy developers, embracing the cheaper Chinese alternatives will instantly reduce costs. As the quality of the Chinese turbines improves, analysts have reason to be optimistic about increased domestic production and the positive impact on world turbine prices more generally.
