In Search of a New Energy Source, China Rides the Wind

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HUITENGXILE, China, June 25 - From the distance the turbines look almost forbidding, looming very large on the horizon like some clawed space invaders. But one must get up close, very close, to hear the slightest hum as their blades spin, harvesting power from the wind.

Apart from the random bleating from a huge herd of sheep, the loudest noise in this open, rolling grassland of Inner Mongolia is the buzz from the transformers that dot the plain, collecting electricity from this small army of 96 metallic monsters with their spinning blades.

Blessed with vast, empty countryside and a seemingly permanent stiff breeze blowing across the steppes, the buzz of transformers is growing steadily louder in this far northern province as investors pour money into the wind farm. It is already huge, and may soon be getting much larger.

"Today we're producing 68 megawatts, but by 2008, we'll generate at least 400 megawatts," boasted Li Yilun, the director of the Huitengxile power plant. "By then, we will be the biggest wind farm in all of Asia."

China's skyrocketing energy needs have recently grabbed the world's attention through its bold efforts to take over foreign oil companies like the American oil independent Unocal. It has also made big investments in petroleum production in countries as far-flung as Sudan and Venezuela. But at home, with petroleum growing scarce, coal choking the air of major cities and coal mining killing 6,009 people last year, the Chinese government is moving just as aggressively to develop alternative energy supplies.

By 2020, starting from a minuscule base that it has established only recently, China expects to supply 10 percent of its needs from so-called renewable energy sources, including wind, solar energy, small hydroelectric dams and biomass like plant fibers and animal wastes.

So far, wind power is making the most impressive strides, so much so that even if Mr. Li's boast of soon having the largest wind farm in Asia comes true, he will have plenty of competition within China alone.

Already, large wind farms are sprouting up in much more heavily populated provinces, like Guangdong, Fujian and Hebei, and with Chinese and foreign turbine manufacturers competing furiously for this fast-expanding market, the cost per kilowatt is becoming increasingly competitive with China's abundant coal. Many coastal provinces, meanwhile, are developing plans to build wind farms just offshore, where winds are strong and land use is not an issue. Projects like these are expected to deploy huge new turbines with 87-yard-long blades, each capable of generating 1.2 megawatts of electricity, enough to power hundreds of homes, if not more.

"We have huge goals for wind power development," Wang Zhongying, director of China's Center for Renewable Energy Development. "By 2010, we plan to reach 4,000 megawatts, and by 2020 we expect to reach 20,000 megawatts, or 20 gigawatts." If anything, Mr. Wang said, these targets are too conservative, and may be easily surpassed.

The biggest limitations, he said, were not in China's wind-power potential, or in its generating technology, but rather in the country's antiquated power grid, which cannot automatically reroute power from one region to another as demand and supply rise and fall. That makes it difficult to take full advantage of wind power, whose output vacillates according to the weather.

China's wind-power program has roots in a visit to the United States 18 years ago, early in the country's economic takeoff. A Chinese delegation witnessed modern wind turbines at work in Utah, then came back determined to adopt the technology at home.

"We bought some turbines and brought them to Urumqi to see how they performed, and the production data was very, very good," said Wu Gang, a member of the delegation who was fresh out of engineering school at the time.

What followed is a story that encapsulates some of the main ingredients of China's economic miracle, including the disciplined marshaling of intellectual and financial resources by a state determined to solve a problem and establish a sector it deems strategic.

After his return from the United States, Mr. Wu was put in charge of a state-financed wind farm in the western province of Xinjiang, where he was able to master all the

technical aspects of the business. Later, the government provided the seed money for the business he now directs, the Goldwind Science and Technology Company. It is China's largest producer of wind turbines, and remains 55 percent state owned.

China has backed wind power and other alternative sources in other ways. It has provided tax incentives for developers, imposed standardized electricity rates that amount to a subsidy for power sources like wind, which remain more expensive than coal, and has imposed equipment requirements that help local manufacturers.

In February, the Chinese government passed a nationwide renewable energy law that formalizes many of those incentives and mandates clear targets for increased power generation from alternative energy sources. China's provinces will be required to buy electricity from alternative providers, even when the cost per kilowatt is substantially higher.

The outcome has been a real boom among suppliers of wind power equipment. "We're expecting the sector to grow 50 to 75 percent a year between now and 2020," said Jens Olsen, the chief representative of Vestas, a Danish turbine manufacturer that is the leading equipment supplier in China.

"The problem here now is the sector is growing so fast that the equipment producers can't keep up," said Mr. Wu of Goldwind. "China has a strong industrial base, and last year, more than 10 Chinese companies came into the market, but they will find that wind energy is not so easy. It involves so many different kinds of knowledge: aerodynamics, computer science, turbines, gear boxes."