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FEATURE

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WIND DISPELS DARKNESS IN CHINA

by BIAN JI

Darkness has been dispelled once and for all on a small far-off island that is beyond the reach of the power network, off the East China coast. As night falls, local fishermen and women read books or operate sewing machines under bright electric lamps in their homes.

An 18-kilowatt prototype wind-turbine generator has been working well, with normal voltage and frequency, since it was installed last year on Sijiao Island, one of the Zhoushan Islands in the fishing waters of Zhejiang province. It starts generating electricity when wind velocity reaches eight metres per second. The turbine rotor blades are 13 metres in diameter and are supported by a tower 12.9 metres high.

The wind-driven generating unit is the biggest of its kind designed and built in China to date. In addition to lighting fishermen's homes on the island, it supplies power for local desalination equipment and for electric welding.

Based on the operating experience of this test installation, the Zhejiang provincial machine-building department is now designing and manufacturing 40-kilowatt wind-turbine generators.

The 18-kilowatt unit is one of the wind-driven generators used experimentally in China in the past year in its research and experimentation on wind power stations. In view of wind power potential along China's long

coastline and on the vast exposed hilly districts and grasslands, wind-driven generators could become important new energy producers for the country.

A two-kw wind-turbine generator with three steel blades of four metres in diameter, installed on a nine metre high tower, has been operating without problems for more than a year at a remote railway station located in Xinjiang's Turpan Depression. This wind-turbine is propitiously placed in China's lowest and hottest spot, known as a "wind source on the land". Here, eight-grade winds blow more than 100 days each year.

The wind-turbine generator supplies electricity for the station's signaling and lighting systems and nearby households. The surplus electricity is accumulated in a storage battery that assures the continuity of supply in windless days. The generator and battery set produces enough electricity in two windy days to supply the station for half a month.

Experiments with fuel-free and pollution-free wind power plants are being carried out in many places of China. Several hundreds of wind-driven generators, with capacities ranging from 100 to 250 watts, have been produced in Inner Mongolia, Shanghai, and Heilongjiang. They are being used by herdsmen in remote pastoral areas or by out-of-the-way weather stations, telecommunications posts, and lighthouses. Small wind power generators, each with a capacity of 2000 watts, are in trial operation on the grasslands of Inner Mongolia, Gansu, and Heilongjiang provinces.

The parts of China located in monsoon-swept Southeast Asia have very rich wind resources. Surveys show that wind energy is mainly distributed over the vast grasslands on the Qinghai-Tibet Plateau and the Inner Mongolia Highland, and along the southeast coast. The annual mean wind speed in the pastoral areas is 4 to 4.5 metres per second. In coastal areas of Zhejiang and Fujian provinces in east China, winds with a velocity over 8 metres per second blow 5500 hours a year. Exploiting such favourable natural conditions and developing wind power generation is an important way to achieve electrification in these areas.

The experimentation of wind power stations has now become a major scientific research field in China. The Chinese Ministry of Power Industry has set itself the goal of producing and popularizing small wind-driven generators that are reliable, simple, and inexpensive. Meanwhile, the ministry and its research institutes are continuing their experiments of key technology for medium-sized generating units so as to standardize and perfect them to meet the pressing needs for electricity in remote areas.

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