

Kites could provide electricity for 100,000 homes

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Scientists from TU Delft have demonstrated that flying a 10-square-meter kite could generate 10 kilowatts of power, which could supply electricity for about 10 homes.

High-flying kites tethered to generators could supply as much as 100 megawatts of electricity, enough to power 100,000 homes, according to researchers from the Delft University of Technology in The Netherlands.

The scientists have recently demonstrated that flying a single 10-square-meter kite could produce 10 kilowatts of power, which could supply electricity for about 10 homes.

In their next experiment, the researchers plan to test a 50-kilowatt version, called Laddermill. Eventually, their goal is to build a multi-kite system that could generate a full 100 megawatts.

As project leader and professor of sustainable engineering Wubbo Ockels explains, kites generate power by pulling on their strings that are attached to generators on the ground. After reaching their maximum height, the kites are reeled back down to repeat the process.

Electricity produced by kites in the wind could be inexpensive, too. The researchers predict prices to be comparable with generating electricity using coal power, and half that of using wind turbines.

One advantage of kites is their potential height. Commercial windmills generally reach heights of around 80 meters, where the average wind speed is about 5 meters per second. At higher altitudes, such as 800 meters, the average wind speed is about 7 meters per second. Because the amount of power available from the wind is related to the cube of its speed, blades at higher altitudes could generate up to five times the amount of electricity as at lower altitudes. High-altitude wind is also generally more reliable than ground-level wind.

While building an 800-meter-tall windmill would be impractical, a kite can easily reach that height, and take advantage of the higher wind speeds. The Dutch scientists note that a high-speed jet stream makes countries such as the UK, The Netherlands, Ireland, and Denmark especially good locations for kites.

Using computer models, researchers can determine how to configure kites so that they get the most out of the wind. Ockels' system used figure-eight flying patterns developed by Allister Furey of the University of Sussex, an arrangement that increases the speed of the air flowing over the kites. He's also investigating a yo-yo configuration, where one kite goes up as another falls from the sky like a glider.

"Pretty much anywhere in the UK you could run a kite plant economically, but you couldn't run a wind turbine economically," said Furey.

Several other scientists are investigating the use of kites to harness energy from the wind - which some researchers estimate provides more than 100 times the amount required to power the entire planet. In 2007, Google's philanthropic arm invested about \$10 million in a US kite company called Makani. An Italian company called Kitegen has a multi-kite scheme that could generate a gigawatt of power, as much as a standard coal plant.

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