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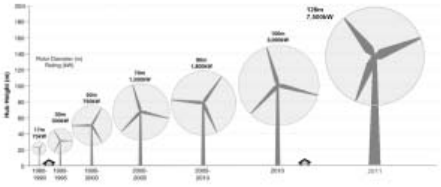
Micro-Windmills May One Day Power Your Smart Phone



Bigger is better has practically become a rule of thumb in the wind power business.

Indeed, the typical wind turbine size has grown from about 300 kilowatts in 1990 to a whopping 7.5 megawatts in 2011.

A team of electrical engineers in Texas is challenging the industry's conventional wisdom by building a wind turbine about 1/10 the size of a single grain of rice.

J.C. Chiao, a professor of electrical engineering at the University of Texas, Arlington, and Smitha Rao, a graduate research associate at UT, Arlington, developed the so-called micro-windmill technology based on recent advances in micro-robotic devices.

The micro-windmills are about 1/15 of an inch wide and can generate electric power from ambient wind.

The tiny wind turbines "blend origami concepts into conventional wafer-scale semiconductor device layouts so complex 3-D moveable mechanical structures can be self-assembled from two-dimensional metal pieces utilizing planar multilayer electroplating techniques," according to a press release.

A micro-windmill is pictured on the face of a penny.

Chiao thinks the technology could one day be used to power portable electronics and recharge cell phone batteries.

An iPhone 4 could fit about 2,040 of the micro-windmills on its surface, each one generating electricity from ambient wind currents.

“Imagine that they can be cheaply made on the surfaces of portable electronics, so you can place them on a sleeve for your smart phone,” said Chiao. “When the phone is out of battery power, all you need to do is to put on the sleeve, wave the phone in the air for a few minutes and you can use the phone again.”

Unlike many micro-electrical-mechanical-system (MEMS) devices, the aerodynamic design of the nickel-alloy-based micro-windmills make the machines extremely durable.

The windmills can endure prolonged exposure to strong winds without any fracture in the material.

“We’ve only scratched the surface on how these micro-windmills might be used,” said Rao.

WinMEMS, a MEMS manufacturer based in Taiwan, has agreed to commercialize the micro-windmill technology.
