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Using Windmills Smaller Than A Grain Of Rice To Charge Portable Devices

By Charles Kennedy of [OilPrice.com](#)

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Smitha Rao and JC Chiao, two researchers from the University of Texas at Arlington, have designed a unique concept to charge mobile electronic devices that use tiny [micro-windmills](#) attached to the surface of the device.

The design was initially created when trying to discover new methods of harnessing wind energy in regions where large wind turbines cannot be deployed. By scaling down the size of the turbines Rao and Chiao hoped that they could create more uses for, and grant more people access to wind energy.

The micro-windmills are only 1.8 millimetres at their widest point (compared to full sized turbines which can be from 40-90 metres wide), meaning that nearly ten can be attached to something the size of a grain of rice. The turbines would turn as the air passes over them whenever the device on which they are installed is moved during normal everyday use.



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A micro-windmill on a penny.

An [article](#) on the UT Arlington website explained that Rao had earned the interest of a Taiwanese company with some of her previous work on micro-robotic devices. The company invited her, along with Chiao, to brainstorm some new devices that could be produced using current fabrication techniques.

“Rao’s designs 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 that have been optimized by WinMEMS Technologies Co, the Taiwanese fabrication foundry that took an initial interest in Rao’s work,” reported the article.

Rao stated that *“the company was quite surprised with the micro-windmill idea when we showed the demo video of working devices. It was something completely out of the blue for them and their*



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It's very gratifying to first be noticed by an international company and second to work on something like this where you can see immediately how it might be used. However, I think we've only scratched the surface on how these micro-windmills might be used."

Apparently the cost of making just one micro-windmill is the same as making hundreds or thousands on a single sheet, meaning that it is [easy to scale up production](#) without incurring huge costs.

Chiao tried to explain how the devices could be useful in every day life. *"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. 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."*

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