Solar Power With A Twist

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Solar power is now available with a twist, thanks to U.S. researchers who found a way to make efficient silicon-based solar cells that are flexible enough to be rolled around a pencil and transparent enough to be used to tint windows on buildings or cars.

The finding appeared Sunday in the journal Nature Materials.

The technology offers a new way to process conventional silicon by slicing the brittle wafers into ultra thin bits and carefully transferring them onto a flexible surface.

"We can make it thin enough that we can put it on plastic to make arollable system. You can make it gray in the form of a film that could be added to architectural glass," said John Rogers of the University of Illinois at Urbana-Champaign, who led the research.

"It opens up spaces on the fronts of buildings as opportunities for solar energy," Rogers said.

Solar cells are in high demand due to higher oil prices and concerns over climate change.

Many companies, including Japanese consumer electronics maker Sharp Corp and Germany's Q-Cells are making thin-film solar cells. However, those cells typically are less efficient at converting solar energy into electricity than conventional cells.

Rogers said his technology uses conventional single crystal silicon. "It's robust. It's highly efficient. But in its current form, it's rigid and fragile," he said.

Researchers used a special etching method that slices chips off the surface of a bulk silicon wafer. The sliced chips are 10 to 100 times thinner than the wafer.

Rogers said, once sliced, a device picks up the bits of silicon chips "like a rubber stamp" and transfers them to a new surface material.

"These silicon solar cells become like a solid ink pad for that rubber stamp. The surface of the wafers after we've done this slicing become almost like an inking pad," he said.

"We just print them down onto a target surface."

The last step is to electrically connect these cells to get power out of them, he said.

Rogers envisions the material being "rolled up like a carpet and thrown on the truck."

He said the technology has been licensed to a startup company called Semprius Inc in Durham, North Carolina, which is in talks to license the technology.

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