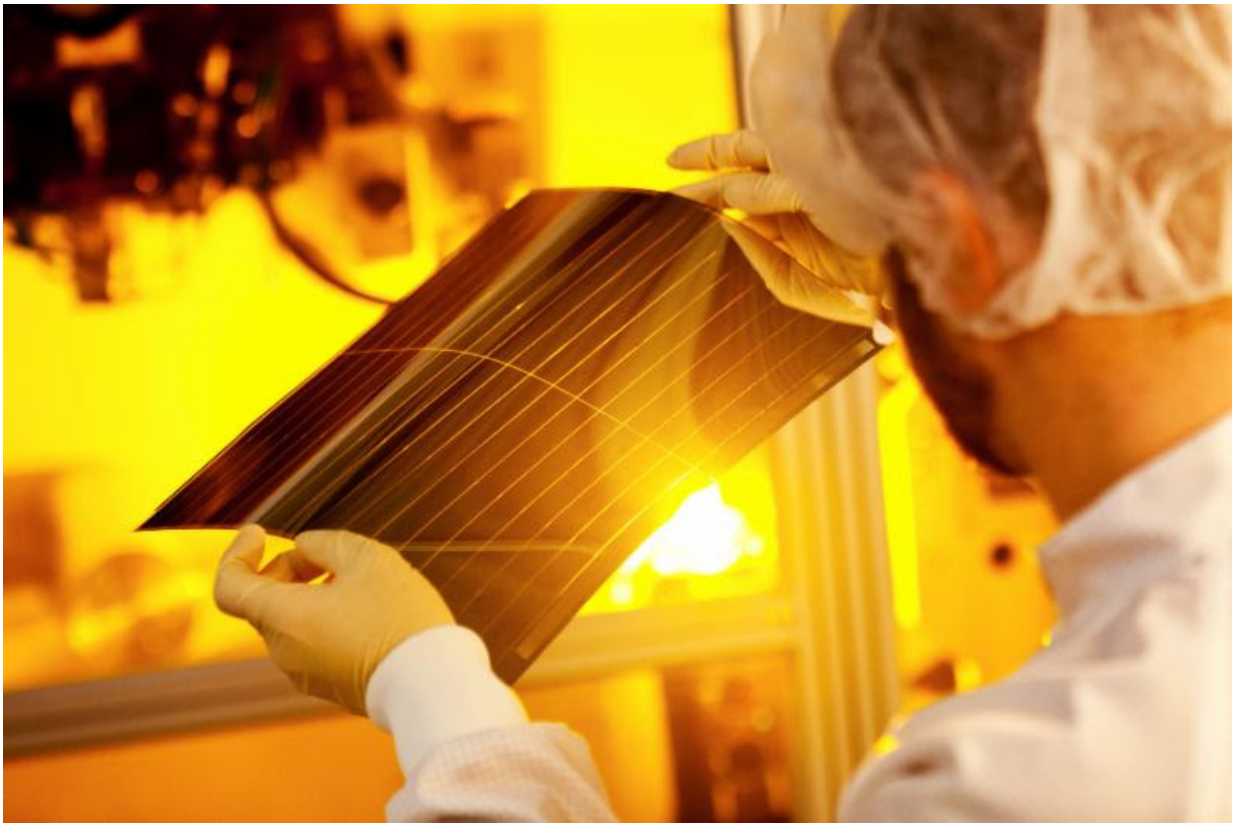
Organic photovoltaic cells: Heliatek claims conversion efficiency record

February 13 2016, by Nancy Owano



Heliafilm - superior low light and high temperature energy harvesting performance.

Note that number, 13.2 percent. Heliatek, in its research for new organic absorber materials, said it set a new organic photovoltaic (OPV) world

record. A world record for what? The record is for the direct conversion of sunlight into electricity using organic photovoltaic cells.

That was the announcement out of Dresden earlier this month; researchers from Heliatek said the company reached a record conversion efficiency of 13.2 percent for an OPV multi-junction (using more than one material) cell. Fraunhofer Center for Silizium-Photovoltaik (CSP) provided independent confirmation.

What contributed to their record? The company said it was thanks to the "excellent low light and high temperature behavior of the organic semiconductor."

Heliatek is a 2006 spinoff from the Technical University of Dresden (IAPP) and the University of Ulm. Its calling cards have highlighted its expertise in organic optoelectronics and oligomer synthesis; the company has gathered an impressive team of physicists, chemists and engineers. Its mission involves making a difference for a "sustainable solar future."

"The combination of our know-how in chemical synthesis and applied physics together with our advanced engineering capabilities allows Heliatek to make faster and larger leaps forward in OPV technological developments than anybody else."

Mark Osborne, senior news editor at *PV Tech*, said they had a small molecule, vacuum deposition process on a plastic film substrate.

The cell is a multi-junction cell combining three absorbers. Each of them is dedicated to convert green-, red- or near-infrared light of the wavelength range between 450 and 950 nm into electricity. The substrate or bottom layer is flexible plastic; *CleanTechnica* said "the whole thing can be put together using conventional, high volume vacuum deposition and roll-to-roll technology, which accounts for its low cost."

CleanTechnica spelled out what this may mean for end users: "New Record For Organic Solar Cells Today, Solar-Powered Car Tomorrow." Tina Casey wrote, "Heliatek has this idea that one day, cars will be covered in solar coatings that will enable you to charge up while scooting down the highway or parked in a sunny spot. That's the big picture. For now, Heliatek is focusing on replacing your sun roof with an organic solar cell window treatment, and the company has just announced a major step forward in the efficiency of its organic solar cells."

Heliatek has a roadmap towards 15 percent efficient organic solar cells; that is the company goal.

CleanTechnica, meanwhile, talked about applications."Heliatek is putting out feelers for solar sun roof manufacturing partners. The idea would be to increase and stabilize interior comfort without drawing excess electricity from the battery. In effect it would act as a range extender for electric vehicles as well as a gas-saver for gasmobiles or hybrids. The solar-equipped sun roof would also enable you to operate electronic equipment while parked, without sacrificing battery range."

Casey said that Heliatek was also exploring applications for the trucking industry. The advantage for use there would be in shaving power consumption during peak use times.

As for organic photovoltaics in general, they are on the rise, said NanoFlex Power Corporation. "Organic electronics have gained rapid acceptance in the electronic display industry due to their low cost and ultra-thin, flexible form factor. Organic technology can also be applied to solar photovoltaics to completely redefine the way solar cells are fabricated and how and where solar power is used."

NanoFlex has research partners at the University of Southern California and the University of Michigan; the partners are recognized for their

work with organic electronics.

Last month, Frank Markus reported in *Motor Trend* that "NanoFlex Power Corporation is developing a solar photovoltaic paint that will. It ditches the more common inorganic silicon or gallium-arsenide photovoltaic chemistry for a new organic (carbon-based) semiconductor chemistry. This setup can be applied extremely thin and can be virtually clear for use even as a window film."

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