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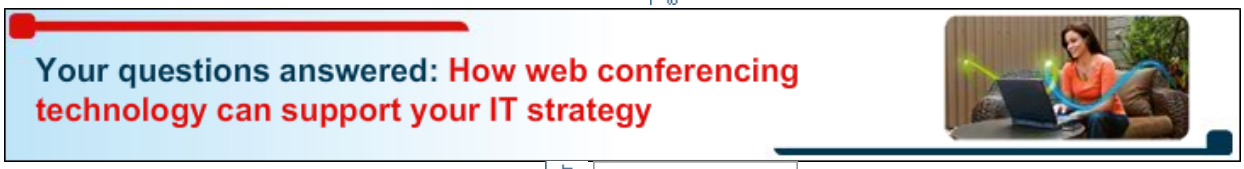

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Illinois team opens window on transparent solar cells

Researchers' thin film silicon-based cells could result in tinted glass capable of generating electricity

Danny Bradbury, BusinessGreen, 09 Oct 2008

Experts from the University of Illinois have produced a manufacturing technique that could enable transparent solar modules to be printed onto flexible substrates using monocrystalline silicon, potentially paving the way for windows capable of generating solar power.

The research team, which published its findings in the latest issue of ***Nature Materials***, has developed a way to create flexible solar surfaces using thin slices of common monocrystalline silicon material that are lifted off with a stamp and transferred to a substrate.

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Unlike conventional solar panels, the transfer printing method used to produce the cells results in a thickness of around 100 nanometres.

"The efficiency of the microcells that we make now is about 12 per cent," said **John A. Rogers**, founder professor of materials science and engineering and a professor of chemistry at the University of Illinois. "This value is achieved with monocrystalline silicon as the active material, but with otherwise very simple designs.

"More advanced cell designs - such as anti-reflection coatings and light-trapping structures - that are already proven for conventional bulk cells should be applicable to our microcells. If that turns out to be the case, 20 per cent to 22 per cent efficiencies should be possible."

The ability to choose the spacing of cells in solar arrays will make it possible to alter the transparency of solar modules produced using the design, according to Rogers, which could open up applications for building-integrated photovoltaic (PV) systems.

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"Flexible PV, in general, is quite attractive for integration on building rooftops and outer structural surfaces," he said. "Semitransparency enables integration with architectural or automotive glass."

Rogers is a co-founder of **Semprius**, a startup company that hopes to use similar semiconductor printing technology to produce thin semiconductor surfaces on various substrates. The company has highlighted flexible displays as a potential application for its technology.

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