

Sustainability Engineering Group Newsletter

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Tiny Solar Cell Could Make a Big Difference



How small can a solar cell be and still be a powerhouse? How about six hundred microns wide - about the diameter of a dot made by a ballpoint

Issue: 26

January 2012



Dear Friend,

Hard to believe but 2012 is here and you need to get moving. As the economy stabilizes growth will be coming and you don't want to miss out on the recovery. Give us a call to review those plans or to help get that project going.

If you get a moment we have many of our past projects available for review on our website. Your input is greatly appreciated and we look forward to hearing from you.

Sincerely, Ali Fasih
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Are electric cars losing spark with public?

The plug-in car revolution is feeling more like a fizzle.

A year after the first two plug-in electric cars from major makers went on sale, buyers appear put off by high sticker prices -- even with federal subsidies -- and, for the moment, by more-stable gasoline prices.



The Nissan Leaf and Chevrolet Volt also have had their own issues. For owners of the Leaf, and other electric-only vehicles, there still are relatively few places to plug in and recharge away from home, limiting use. And the Volt, which has a backup gas engine to run a generator for extended range, is under the shadow of a government safety probe of why its big lithium-ion battery pack could catch fire days or even weeks after suffering severe crash damage.

Meanwhile, some startup makers of electric cars, including the Think City car and the egg-shaped Aptera, have gone bust. Others have hit potholes and delays in their drive to get plug-in cars in front of buyers

pen? The U.S. Department of Energy's National Renewable Energy Laboratory recently validated greater than 41 percent efficiency at a concentration of 1,000 suns for tiny cells made by Semprius - one of the highest efficiencies recorded at this concentration. The energy conversion efficiency of a solar cell is the percentage of sunlight converted by the cell into electricity.

Seed money from DOE, together with the experts at the NREL-based SunShot Incubator Program, lifted Semprius from a small electronics start-up with a novel idea to a real difference-maker in the solar cell world.

Semprius' triple-junction cells are made of gallium arsenide.

Low-cost lenses concentrate the sun light onto the tiny cells 1,100 times. Their tiny size means they occupy only one-one thousandth of the entire solar module area, reducing the module cost. In addition, the use of a large number of small cells helps to distribute unwanted heat over the cell's structure, so there's no need for expensive thermal management hardware such as heat

Even some major automakers have had hiccups developing new plug-ins.

Electric cars on the way to showrooms also face stiffer competition from conventional cars and hybrids that not only are cheaper, but also have gotten more fuel-efficient as automakers work to meet tightening federal fuel-economy rules.

Read More: [Arizona Republic](#)

After Three Decades, Tax Credit for Ethanol Expires

40 percent of the United States corn crop goes to ethanol and byproducts



A federal tax credit for ethanol expired on Saturday, ending an era in which the federal government provided more than \$20 billion in subsidies for use of the product.

The tax break, created more than 30 years ago, had long seemed untouchable. But in the last year, during which Congress was preoccupied with deficits and debt, it became a symbol of corporate welfare. Fiscal conservatives joined liberal environmentalists to kill it, with help from a diverse coalition of outside groups.

In the United States, most ethanol is produced from corn. The demise of the subsidy is all the more remarkable because it comes at the peak of the political season in Iowa, where corn is king.

"We are in a fairly prosperous period for agriculture," said Dean C. Taylor, a former president of the Iowa Corn Growers Association. "Agriculture has not been as much of a touchstone for presidential candidates this time around."

Mr. Taylor, who grows corn and soybeans in Prairie City, Iowa, east of Des Moines, said in an interview that the loss of the tax credit "will reduce the profit margin for a lot of people in the ethanol business." But, he added, "It won't be fatal as long as the demand for ethanol and gasoline remains strong."

Read More: [New York Times](#)

TIA plans solar art piece

Centennial airport sculpture will have interactive feature

The Tucson Airport Authority has commissioned an interactive "solar sculpture" at the airport to celebrate Arizona's centennial and the city's solar status.



fins.

Semprius engineers use the company's patented micro-transfer printing process to allow the micro-cells to be transferred from the growth substrate to a wafer. In a massive parallel process, thousands of cells are transferred simultaneously. This allows the original substrate to be used again and again, dramatically cutting costs. It also provides a way to handle very small cells.

This low-cost approach, which Semprius executives say can cut manufacturing expense by 50 percent, caught the eye of energy giant Siemens, which this year took a 16 percent stake in Semprius, as part of a \$20 million investment from venture capitalists.

Read more: [Renewable Energy World](#)



9 Electric Vehicles for 2012 @ LA Show

But you'll have to wait until it's unveiled at Tucson International Airport in April to see what it looks like.

The \$30,000 project was awarded last week, after a competitive call process, to Fairfield Enterprises, headed by Southern Arizona-based public artist Stephen Fairfield, in collaboration with Tucson-based electrical engineer and solar-power advocate Patrick Marcus and Chicago-based designer Emily Taylor.

The outdoor steel sculpture - planned for a prime spot along the terminal loop exit lanes - will feature "upward flowing, arching lines that flow into the form of a futuristic aircraft," the airport said.

Fairfield said the roughly 18-foot-high, 20-foot-long piece will be lighted with color-changing LED (light-emitting diode) lights, powered by photovoltaic cells. The lights will be activated in different patterns by programmable controls and motion detectors, allowing passers-by to manipulate the display.

Read More: [Arizona Daily Star](#)

Please feel free to email us your input, comments and suggestions to help make this newsletter a success. Your input is very valuable. Have a wonderful day.

Sincerely,

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As a small engineering firm, we provide competitive prices with heightened level of services. We would like the opportunity to propose on your future civil engineering projects. SEG has served as a lead consultant for public and private agencies in Arizona and throughout the western region of the United States.

Additionally, we have a great deal of experience in Transportation, Master Planning and entitlements, civil engineering, water / wastewater treatment plant, Hydraulic / Hydrology and sustainability investigation.

SEG's key members provide more than 150 combined years of experience in public and private sector work. We do hold Professional Engineer licenses in Arizona and California.

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