

## New Solar Cell Production System Could Drive Down Costs

By Art Chimes Washington

12 December 2007

Solar power would seem to be the ultimate energy source - no pollution, no greenhouse gases, seemingly unlimited. But, although solar cells have their uses, they remain a niche product because solar electricity costs may up to three times more than electricity from coal or other conventional sources. As Art Chimes reports, a new way of making solar panels may be changing that, however.

Popular Science magazine is out this month with its annual 'Best of What's New' issue, showcasing 100 of the year's best innovations, from computers to spacecraft to cameras. They chose one as their Innovation of the Year, and it is, potentially, revolutionary.

"This is the innovation that has the potential to really, finally make solar power feasible, make widespread solar power affordable and a real viable option to coal and other hydrocarbon-based fuels," said executive editor Mike Haney.

He's talking about a new way of making thin-film solar cells that can be likened to printing a newspaper. Instead of rolls of paper, though, it uses rolls of thin metal foil, and the ink is a liquid form of the semiconductor material that converts light into electricity. It's all aimed at reducing costs, says Brian Sager, a co-founder of California-based Nanosolar, Inc., which developed the process.

"What Nanosolar has done is develop an aggregate of process innovations that dramatically decrease the cost of using this material, depositing it much more rapidly, much more efficiently, with much better capital efficiency as well, and thereby dropping the cost of the solar panels dramatically," said Sager. "We're aiming for grid parity."

Grid parity means consumers would pay about the same for solar power as they do now for coal or nuclear. In the United States, that's about 8 to 10 cents per kilowatt hour, or about one-third the current price of electricity from solar cells.

As the company name suggests, its product relies on nanotechnology, which for some people might be a source of concern, but Sager says, not in this case.

"There are no nanoparticles in our final device," he explained. "So we use the nanoparticles as a way to coat this ink onto the foil, but then when we process it, those particles are attached together in a continuous film, so there are no longer discrete particles in the final device, so we don't have any risk of exposure of nanoparticles."

The solar panel foil can be rolled out as roofing material or put on the sides of buildings in a city. Sager also imagines land just outside urban areas covered with his solar energy-collecting powersheets.

"And the solar panels are interconnected to create a certain amount of output, which could be used to power a city," he said. "And this could be done just outside the city so that you minimize the transmission loss from getting that electricity from the [solar] power plant to the end users."

Nanosolar has factories in Germany and a big, new one in California, so economies of scale should make an important difference in the impact of solar power.

"When they get this San Jose plant online, they're going to create more megawatts worth of solar cells in a year than every other solar plant in the U.S. [combined], and that's only one plant," says Popular Science editor Haney. "So surely once they get that one going, and, you know, as some of these other companies catch them and develop their own ways of doing it and start cranking it out, I think- I think the leap in scale of solar being used is going to be pretty incredible in the next five to 10 years."

Popular Science's choice of Nanosolar solar cells as their Innovation of the Year came at the end of a year in which the consensus solidified that greenhouse gases - such as those produced by burning coal and oil - are warming our planet.

The magazine isn't alone in its enthusiasm for Nanosolar. Google founders Larry Page and Sergey Brin are among those who have invested in the privately-owned company. And last month, Google announced a new initiative to help develop solar and other renewable energy technologies that can deliver city-scale electric power for less than the cost of electricity from coal.