

POWER UMBRELLA
KONARKA'S SOLAR
TECHNOLOGY CAN BE
PLACED ON FABRIC.



GREEN TECH

Plastic Power

A startup has a new solar technology so light and malleable that it could charge your laptop—or light up a skyscraper. **By Barney Gimbel**

INSIDE A CONVERTED textile mill in Lowell, Mass., Rick Hess unfurls a roll of brown plastic film attached to a small electric meter. “Three volts,” he says, smiling. “And that’s just from the light in this room. Imagine what this reads when we’re outside.”

Hess, who runs solar upstart Konarka, is showing off Power Plastic, a new lightweight, flexible, and cheap material that converts indoor and outdoor light into electricity. Think of it as a solar panel that rolls up like camera film. “Soon you may not even need batteries,” Hess says, holding a prototype of a portable device that will recharge your cellphone in an hour. “We can put this stuff anywhere.”

Lowell-based Konarka (named after a temple dedicated to a Hindu sun god) currently sells small amounts of its Power Plastic for use on outdoor umbrellas and tote bags that will recharge a cellphone whether you’re on

the go or on the beach. That potential impressed investors, who have put \$145 million into the closely held venture, including a recent \$45 million in funding from French oil giant Total. “We believe the solar market in the U.S. will accelerate between 2010 and 2015, and we need to be ready for this,” says Philippe Boisseau, president of Total’s gas and power business. “By then Konarka products could become mass market.” Konarka won’t disclose its revenue.

Sure, solar chips have been used to power calculators, watches, and other small gadgets for years. But most are made of silicon, the material found in computer chips—and they are rigid, fragile, and expensive to manufacture. (Think clean rooms with skilled techies in space suits.) Konarka’s film rolls off a converted printing press that used to belong to Polaroid. It prints a secret plastic ink onto rolls of thin

film. As it absorbs light, the polymer ink emits electrons, producing electricity.

In a few years, Hess says, Konarka will have perfected a translucent version of its product that could be built into the windows of skyscrapers, generating enough power to run whole buildings. It is also working on projects for the Department of Defense to make solar-power tents that recharge soldiers’ equipment in remote locations. Eventually the technology could even be woven into clothing—imagine slipping your cellphone into your pocket to recharge it.

Thin-film solar technology is a promising new field in alternative energy—and it’s attracting loads of venture capital. Many startups, including HelioVolt in Austin, Miasolé in Santa Clara, Calif., and Nanosolar in San Jose, are working on similar products. Most, however, are made of metal foil as opposed to plastic, which means they’re not as light or flexible.

Power Plastic, however, does have its drawbacks. So far it is not nearly as efficient or durable as traditional silicon panels. Konarka’s cells convert about 6% of the light that hits them into electricity, whereas silicon solar panels typically are 16% to 20% efficient. Hess says Konarka hopes to double its efficiency within a few years. Power Plastic also doesn’t last nearly as long—about five years as opposed to more than 30 with silicon panels. But Hess argues that it doesn’t matter because his product will be cheap to replace.

Barry Maranta, president of SkyShades, an Australian company that makes solar patio umbrellas and lightweight awnings for parking lots, says he plans to purchase a few hundred thousand square meters of Power Plastic this year. (It sells for \$100 to \$200 per square meter.) He hopes to put enough Power Plastic on parking lot canopies at Orlando International Airport to generate \$150,000 of electricity a year, which translates into a 35% return on investment over a decade, he says. “People used to buy solar panels because it made them feel good about themselves,” Maranta says. Thanks to companies like SkyShades and Konarka, perhaps going solar will also lead to brighter balance sheets. ■



FLEXIBLE VOLTS KONARKA'S FILM, SHOWN CHARGING A PHONE