

Watt's Happening? #91

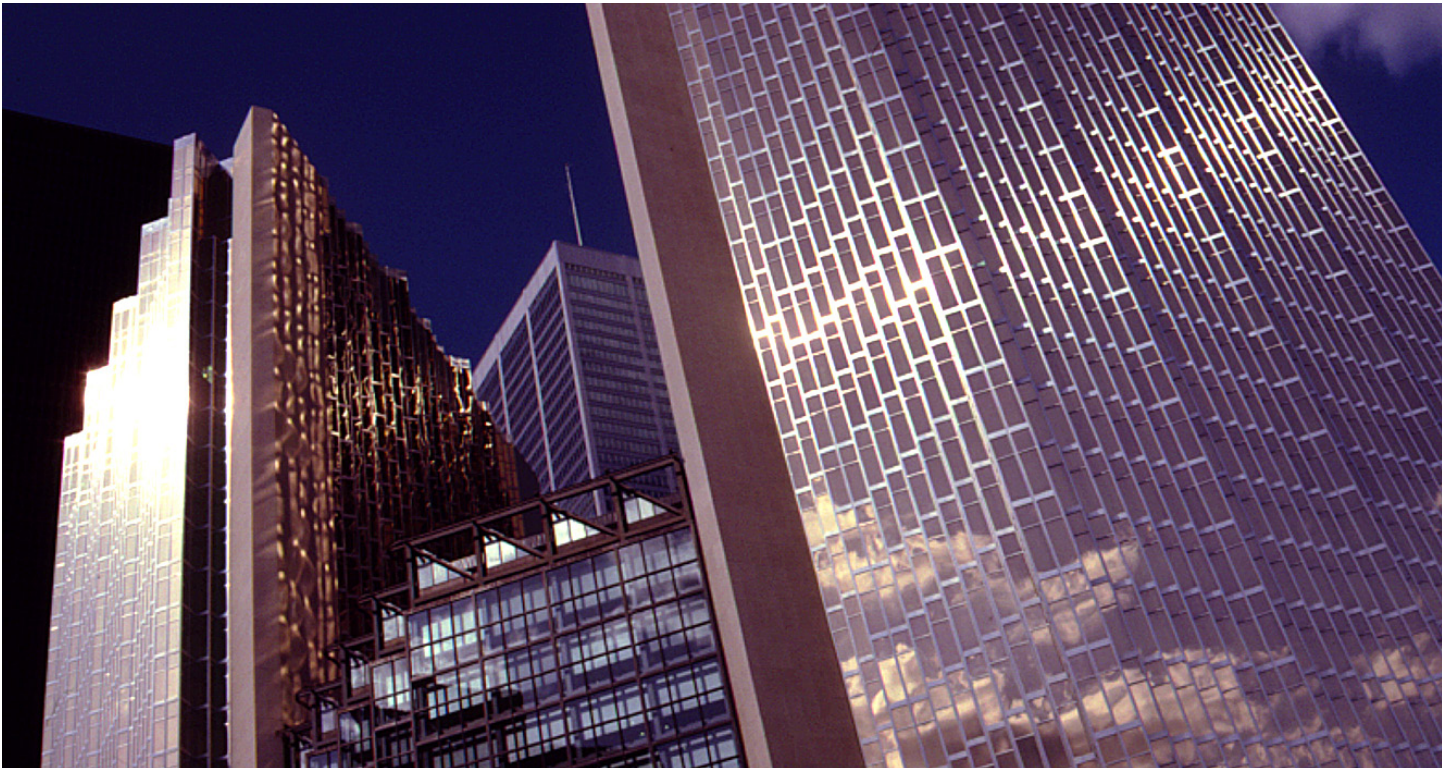
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Creative Energy



Windows that generate electricity are quickly becoming a reality that will revolutionize the energy scene.

The one big lesson we can learn from renewable energies like solar and wind is that clean, inexhaustible and immensely powerful energies are all around us, everywhere, all the time. Figuring out how to harvest this vast potential requires the latest technology but more importantly it needs genuine “outside the box” creativity.

And that’s exactly what’s happening. Let’s have a look.

ORGANIC PV HITS RECORD

Cell phones that never need charging, and windows that generate electricity? Coming right up.

Organic photovoltaic (PV) cells made by Heliateck have reached a new world efficiency record, achieving a 17 percent conversion rate. They also have better low light and high temperature efficiency than conventional PV cells.

Most modern PV panels convert sunlight directly into electricity using a semiconductor made from thin sheets of crystalline silicon sandwiched between a plastic backing and a tempered glass front surface.

The panels are strong and last for many decades, but are rigid and best mounted to a solid wall, roof or rack. They are usually about 20% efficient, meaning they convert about 20 percent of the light

hitting them into electricity.

Organic PV will soon match them for efficiency, but offers some pretty revolutionary advantages.

Organic PV can be made into very thin, flexible, transparent sheets. These electricity-generating films can be incorporated into windows or molded onto any irregular surface. Coat a cell phone or iPad with organic PV film, and you won't ever have to charge it. A glass skyscraper with organic PV windows will generate all its own power and much more. For a home, a south-facing wall of PV-coated window glass will not only collect heat and light, but also provide all the electricity the home needs, invisibly.

Already, the amount of electricity a home produces from its rooftop solar array is becoming as important as the number of bedrooms or bathrooms. In the near future, with organic PV incorporated into roofing, siding and windows, energy generation will be an integrated part of the house, not just an add-on.

Expect to see widespread organic PV hitting the market within five years.

THE SOLAR LEAF

Developed at MIT, the Solar Leaf is made from an inexpensive, thin silicon solar cell. When dropped into water, it automatically uses solar energy to separate the water into hydrogen and oxygen, which when recombined in a tiny fuel cell, produces electricity.

One solar leaf placed in one litre of water can produce 100 watts of electricity, 24 hours a day. (They call it a "solar leaf" because it mimics the photosynthetic process of a real leaf by converting water and sunlight into energy).

With over 1.2 billion people in the world living without electricity, such innovative approaches are seen as reliable, easy ways for the developing world to

buy-pass carbon-based fuels and go directly to low-cost clean energy.

WIND ADDS TO RURAL INCOMES

Most wind generation is in rural areas and represents potential income for rural landowners. Wind can be thought of as a locally made drought-resistant cash crop.

So far, about 200 million megawatt hours of wind have been installed in the U.S., enough to power 17.5 million homes. Iowa generated 31% of its electricity from wind last year, with 12 states generating 10% or more.

U.S. wind farms now pay \$222 million a year directly to farming families and other landowners, helping them to make ends meet. Oklahoma wind farms will return over \$1 billion in property taxes to counties and local schools over their lifetimes, according to an Oklahoma State Chamber report in 2015. In Ohio, a single wind farm adds \$400,000 per year in new revenue to one school district.

SMARTFLOWER TRACKS SUN

The newest thing in home solar is the "Smartflower," a freestanding, 18-foot high petal-shaped unit that can be installed in one hour and moved any time. The Smartflower opens like a blossom at sunrise and shuts at sunset, having tracked and followed the sun all day, making it 40 percent more efficient than a rooftop array. It automatically closes up in high winds, cleans itself, and stores enough power to run a European home. Sweet.

Today, some 25 percent of global power generation comes from renewables. And we've only just begun to harvest the limitless creative energy that nature provides.

The Smartflower is a complete, automatic stand-alone solar tracking and energy storage system for home use.

