



TECHNOLOGY

Sun Chaser

A hybrid concept car would use solar power for short trips

Solar-powered cars have been little more than an experimental novelty to date. Expensive batteries, relatively inefficient energy conversion and the scarcity of sunny days in many regions have made photovoltaic passenger vehicles impractical.

Ford is looking to change that. A version of its plug-in C-MAX Energi hybrid, unveiled at the Consumer Electronics

Association's recent International CES in Las Vegas, would use roof-mounted solar panels to charge a lithium-ion battery. The battery would power the car for trips of up to 34 kilometers, after which the hybrid's gasoline engine would kick in. "This is the world's first plug-in vehicle that doesn't need to be plugged in," says Mike Tinskey, Ford's global director of vehicle electrification and infrastructure.

The concept car gets a boost from an

accompanying 20-square-meter acrylic canopy equipped with lenses that act as a giant magnifying glass, directing intense rays to the car's solar panels. Using sensors and cameras, the car would track the sun's position and autonomously reposition itself under the canopy for optimal exposure. The system enables the car to charge up to eight times faster than simply parking in the sun, Tinskey says.

Ford obviously has some kinks to work out if the concept is to ever see the light of day, much less a sales floor. The cost of the solar cells, tracking system and canopy are an open question. And the vehicle's repositioning system could pose logistical and safety problems. Would the average driveway accommodate a robotically rolling car? And what is to stop it from inadvertently running over an object in its path—such as a person's foot or a dozing cat?

Despite the hurdles, the hybrid marks a promising automotive move—going cordless and energy-independent at the same time.

—Larry Greenemeier

WHAT IS IT?

Liquid crystals, as the name suggests, occupy a state somewhere between a liquid and a solid. Researchers long ago learned how to exploit the unique properties of liquid crystals by manipulating the crystals' rod-shaped molecules to control light in digital displays. Now a University of Pennsylvania team has developed a new optical approach. When the researchers dropped a silica bead into a layer of liquid crystals, capillary forces drew the crystals into hundreds of tiny petals around the bead to form the flowerlike pattern pictured here. The work was detailed in *Physical Review X*.

The self-assembling petals collectively act as a compound lens that focuses light much like a fly's eye. The lens could find use in solar panels, boosting the collection of sunlight, or could form the tip of a fiber-optic probe to give surgeons a better view inside our bodies.

—Annie Sneed

