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NREL building 'solar tree' to give plug-in cars a jolt

By Cathy Proctor
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A cutting-edge Toyota Prius hybrid at the National Renewable Energy Laboratory soon will have a dedicated parking slot -- with shade.

The gasoline-electric hybrid, which NREL has converted to a "plug-in," currently spends its down time at plug-in stations scattered around the lab's campus.

But by early November, the plug-in hybrid will have a new parking slot and power plug offering clean, renewable electricity generated from the sun. A plug-in hybrid can fill its battery with electricity pulled from a standard power plug as well as from its gasoline-powered engine and its braking system.

Golden-based NREL is spending about \$40,000 to build a "solar tree" -- an on-site, renewable recharge station for electric and plug-in hybrid electric vehicles. The new parking structure will be designed and engineered by Envision Solar LLC of La Jolla, Calif.

The tree is essentially a metal frame -- or canopy -- that supports photovoltaic cells above a parking lot. The cells convert sunshine into electricity, and the frame has a plug to connect to the car's battery. The solar panels also offer shade to cars parked underneath.

"Our interest is in trying to help demonstrate the interconnection between renewable resources and our transportation energy needs," said Tony Markel, a senior engineer at NREL who's overseeing the project.

"It's using a valuable resource, an asset that we have, to help displace petroleum."

NREL's solar parking canopy will have 20 photovoltaic panels, and cover about 18 square feet, or two shaded parking spaces, with a single support post. The design has one 120-volt outlet per parking space.

The canopy also will be tied to the region's electricity grid, capable of feeding renewable electricity the car doesn't need onto the grid for use elsewhere.

The annual output is expected to be about 5,000 kilowatt hours of electricity per year. By comparison, a typical Colorado home uses about 7,500 kilowatt hours of electricity per year.

It's the second solar parking canopy project Envision has done, with more on the way, CEO Bob Noble said.

In May 2005, the company finished a "solar grove" of parking lot solar panels in San Diego at the North American headquarters of Kyocera, a company that makes solar panels. That project used 1,400 solar panels and can generate 427,000 kilowatt hours of electricity per year.

Noble, who was formerly the CEO of San Diego architectural firm Tucker Sadler Architects, launched Envision in June 2006.

Envision has seven employees and plans to grow. Noble believes the company will oversee up to \$50 million worth of construction work next year.

Noble said he's excited to be working on the NREL project.

"NREL has been the leader in solar research and they had the vision to say 'let's do this, get a solar shaded structure and address the issue of solar energy and transportation,'" Noble said. "That's central to what we're doing. It's not just clean energy, but the relationship between clean energy and clean vehicles."