Nanotechnology to Create Green Hydrogen

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Hydrogen solar greatly increases the efficiency of creating hydrogen from solar panels by using nanotechnology

British company Hydrogen Solar has doubled the performance of its technology, which **converts light and water directly into hydrogen fuel**.
Dr. David Auty, Hydrogen Solar's chief executive said, "the key to Hydrogen Solar's breakthrough is nanotechnology. Hydrogen Solar developed **a nano-crystalline material that will dramatically improve** the production of hydrogen by using solar energy to split water more efficiently into its elemental parts."

In the coming months Hydrogen Solar plans to open a laboratory in Las Vegas. This will enable it to take advantage of the hot dry area for research. The company is currently recruiting scientists and engineers for the new lab. Hydrogen Solar needs scientists to drive the development work forward and to liase with fundamental research activities. It also needs engineers to participate in the engineering and design aspects of the Tandem Cell, including design of the Cell and components for optimised manufacturing, performance, durability and safety. Hydrogen Solar plans to improve the energy conversion efficiencies of the nano-crystaline thin films, and develop industrial-scale production methods that are consistent and replicate or exceed laboratory results.

Hydrogen Solar expects its technology will be used as a clean, CO2-free fuel for transport and home energy installations. Hydrogen Solar's

Tandem Cell technology is now able to directly convert more than eight percent of sunlight energy directly into pure hydrogen fuel - a doubling of its previous performance. This means the company is fast closing on the target 10 percent performance that has been recognized as the benchmark for commercially viable production on the open energy market.

Dr. Auty says that "at the benchmark 10 percent performance level, a 7 meter x 7 meter Tandem Cell unit on a double garage roof is capable of producing enough hydrogen from sunlight to run a Mercedes A-Class vehicle 11,000 miles over a year in Los Angeles light conditions." The Tandem Cell is expected to be incorporated into building designs, particularly on factory and garage roofs.

Central to the increases in performance of Tandem Cell is the use of nano-crystalline coatings. Using novel metal-oxides, the coatings produce high photo current densities, and create a highly efficient means of converting light and water into hydrogen fuel from one single unit.

In the Tandem Cell there are two photo catalytic cells arranged in series. The front cell is coated with a nano-crystaline film, which absorbs high-energy (ultraviolet and blue) light. The lower energy light (green and red wavelengths) passes through the front cell and into the second. Here, the light excites the electrons in this cell's coating, which sets up an electrical potential. This electricity splits the water molecules in an electrolyte, producing hydrogen.

Source: British Information Services