Honda Begins Operation of New Solar Hydrogen Station in LA

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Honda's Next Generation Solar Hydrogen Station Prototype

Honda began operation of a next generation solar hydrogen station prototype at the Los Angeles Center of Honda R&D Americas, intended for ultimate use as a home refueling appliance capable of an overnight refill of fuel cell electric vehicles.

Designed as a single, integrated unit to fit in the user's garage, Honda's next generation Solar Hydrogen Station reduces the size of the system, while producing enough hydrogen (0.5kg) via an 8-hour overnight fill for daily commuting (10,000 miles per year) for a fuel cell electric vehicle.

The previous solar hydrogen station system required both an electrolyzer

and a separate compressor unit to create high pressure hydrogen. The compressor was the largest and most expensive component and reduced system efficiency. By creating a new high differential pressure electrolyzer, Honda engineers were able to eliminate the compressor entirely - a world's first for a home use system. This innovation also reduces the size of other key components to make the new station the world's most compact system, while improving system efficiency by more than 25% (value calculated based on simulations) compared to the solar hydrogen station system it replaces.

Compatible with a "Smart Grid" energy system, the Honda Solar Hydrogen Station would enable users to refill their vehicle overnight without the requirement of hydrogen storage, which would lower CO_2 emissions by using less expensive off-peak electrical power. During daytime peak power times, the Solar Hydrogen Station can export renewable electricity to the grid, providing a cost benefit to the customer, while remaining energy neutral.

Designed for simple, user-friendly operation, the intuitive system layout enables the user to easily lift and remove the fuel hose, with no hose coiling when the hose is returned to the dispenser unit.

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Engineered for an 8-hour, slow fill for overnight refilling of a fuel cell electric vehicle, the home-use Solar Hydrogen Station would replenish the hydrogen for a typical daily driving, meeting the commuting requirements of many drivers. As with the previous generation system, the hydrogen purity from the new station meets the highest SAE (J2719) and ISO (14687) specifications.

Installed at the Los Angeles Center of Honda R&D Americas, the new Solar Hydrogen Station will employ the same 48-panel, 6.0kW solar array that powered the previous system. The array utilizes thin film solar cells composed of copper, indium, gallium and selenium (CIGS) produced by Honda Soltec Co., Inc., a wholly-owned subsidiary of Honda that was established for the mass production and sales of solar cells capable of efficient renewable electricity generation. Honda's unique solar cells reduce the amount of CO_2 generated during production as compared to conventional solar cells.

Designed to support the needs of the future owners of fuel cell electric vehicles, the Honda Solar Hydrogen Station was also designed to complement a public network of fast fill hydrogen stations. The Honda FCX Clarity electric vehicle is fast fill capable and offers an EPA-estimated driving range of 240 miles. With fast fill public stations providing 5-minute fueling time for longer trips, and the opportunity of convenient nighttime slow filling at home using a solar station with a Smart Grid connection, the Honda FCX Clarity can cover a wide range of driving demands from the daily commute to weekend trips.

A key strategy in creating a solar hydrogen station for home-use was to create a new lifestyle with convenient, clean, energy-efficient and sustainable home refueling, by addressing the need for refueling infrastructure that can advance the wider use of fuel cell electric vehicles by consumers.

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Source: Honda