Electric bicycle gets 60-mile range with portable hydrogen fuel cell

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SiGNa Chemistry's range extender is shown on this Pedego® electric bicycle. Image credit: SiGNa and Pedego.

Claiming to have developed "the most energy dense power solution for electric bicycles," SiGNa Chemistry, Inc., is hoping to greatly improve not only electric bicycles, but many other electric applications. The New York City-based company has developed a cartridge containing sodium silicide, a stable metal powder. When the powder comes in contact with water (including polluted water, sea water, and urine), it instantly produces hydrogen, and the hydrogen is then converted into electricity. According to the company, one cartridge can power a bicycle for a range of up to 60 miles without pedaling.

Compared to advanced Li-ion batteries that have an energy density of about 65 Watt-hours per kilogram, SiGNa's cartridges have an energy density of more than 1,000 Watt-hours per kilogram. The hydrogen cartridge produces up to 200 Watts of continuous power, and excess energy is stored in a Li-ion battery for climbing hills and energy-intensive acceleration.

SiGNa Chemistry demonstrated the "range extender" power system at the Interbike International Trade Expo in Las Vegas at the end of last month. Although the company used the system on a Pedego® electric bicycle, the system is compatible with most other electric bicycle models. Since the fuel cells weigh just 1.5 pounds and are reusable, cyclists can easily replace them on long rides if they have more than one, eliminating the need to stop and recharge.

The hydrogen system is also safe, as the hydrogen is produced at just 50% of the pressure of a soda can. The system's only emission is water vapor, and sodium silicate, an environmentally safe byproduct of sodium silicide, is fully contained in the cartridge.

According to SiGNa President and CEO Michael Lefenfeld, the company plans to take this technology beyond bicycles to serve as a primary or back-up power source for other transportation applications. Other applications include generators, lawn mowers, golf carts, consumer electronics, and any electric application that uses 1 W to 1 kW of power.

SiGNa is currently taking pre-orders for the cartridges (no price listed), and plans to have the product commercially available next summer.

More information: via: Wired