Alcoa and Phinergy show electric car with aluminum-air battery

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The car powered by the aluminum-air battery technology at the Circuit Gilles-Villeneuve in Montreal.

An electric car equipped with an aluminum-air battery system developed by two companies, Phinergy and Alcoa, made its track debut earlier this month. The car performed at Montreal's Circuit Gilles-Villeneuve. The event showcased the technology collaboration effort of the two companies to deliver an air-battery system that can support an electric

car's journey over greater distances. Phinergy is focused on developing zero-emissions, high energy-density systems based on metal-air energy technologies. The company's work involves aluminum-air and zinc-air batteries. The two companies worked on materials, processes and components, with the goal to commercialize the aluminum-air battery. When used to supplement a lithium-ion battery, the battery can extend the range of an electric car by about 1,600 kilometers (994 miles). This is to draw interest because the limited range possible with many lithium battery systems requiring recharging has been a drawback, motivating technologists to look at next generation solutions.

"Electric vehicle adoption has been slowed by the limited range of regular batteries, causing what is commonly known as 'range anxiety'," said Aviv Tzidon, CEO of Phinergy. Drivers who otherwise concur with the need for cleaner transport may hesitate to make extended road trips with electric vehicles, not sure if they would easily access the required infrastructure of fast-charging stations along their travel routes. "Automakers want technologies that enable zero-emission electric cars to travel distances that compete with gasoline-powered cars. The aluminum-air battery has the potential to meet that challenge using fully recyclable material with no CO2 emissions," said Martin Briere, President of Alcoa Canada. Briere said that Alcoa and Phinergy looked forward to collaborating with the Quebec government to advance the technology and potential development of the aluminum-air battery in the province.

The aluminum-air battery uses air and water to unlock the energy stored in aluminum. Phinergy said just one of the 50 aluminum plates in the battery can power a car for approximately 20 miles. Car owners would only need to refill the aluminum air battery with tap water every month or two as a recharge, to support the chemical reaction.

According to the CBC, "Because the car would still rely on its regular rechargeable lithium-ion battery most of the time and would switch to

the aluminum-air battery as a backup only if the lithium-ion battery ran out, and because most car trips are 50 kilometers or less, Alcoa estimates the aluminum-air batteries would only need to be changed about once a year."

The publicity release stated that "The technology allows an energy density that surpasses conventional battery technologies and creates electric vehicles with travel distances, purchase prices and life-cycle costs that are comparable to fossil-fuel cars."

More information: Alcoa press release: www.alcoa.com/canada/en/news/r … es/2014_phinergy.asp

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