25 battery breakthroughs for gadgets, electric cars & the grid

Katie Fehrenbacher on Jul 6, 2010 at 7:00 am

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A lot of people in the battery business are saying that they are optimistic that the battery industry is finally going to get rid. But there continues to be innovation, and there are a lot of companies that are working on new battery breakthroughs. Here are some of the most promising ones, that I've seen in the last few months. I'm sure there's hundreds of companies, entrepreneurs, universities and large companies working on breakthroughs. Here's my

#1. Nano: Nano was founded in 2007 and formally based in Berkeley, which is known for battery innovation. Nano's technology is based on thin-film lithium-ion batteries, and has follow-on founders, Harry Gruber and Micah Balaban. Nano's technology is based on a thin-film lithium-ion battery. The battery is made of a porous silicon anode, a porous lithium cathode, and a porous electrolyte (typically made up of lithium salt in an organic solvent). The electrolyte is the only component that is not porous. The porosity allows the ions to move through the electrolyte and through the anode and cathode.

Nano's thin-polymer electrolyte battery is supposedly safer than other Li-ion batteries. It's not flammable like the liquid electrolyte and contains virtually no loss of capacity under prolonged exposure to high temperature. Nano's thin-film lithium-ion batteries are also supposed to be more electric vehicles are good for start-up companies, because it costs less than a million dollars to develop and that can achieve 20 times the amount of energy density), compared with the thin film anti-WK.Ag commonly found in thin-film batteries. Nano's battery technology is also a good prediction for the future, as most megatrends tend to shift toward lithium-ion. The company is backed by Khosla Ventures, Kleiner Perkins Caufield & Byers, and Draper Fisher Jurvetson.

#2. Pellion: This could be the world's first commercial magnesium battery, which could be a major breakthrough because it could be a safer and more powerful battery than lithium-ion batteries. Pellion was founded by Gerbrand Ceder, Professor of Materials Science at MIT. Pellion was spun out of MIT, and "will leverage both throughout computational materials science and the use of novel, high-capacity, high-voltage cathodes and electrolytes, which will enable high-energy-density magnesium-ion batteries and compatible electrolytes." Pellion's technology is based on a patent that Ceder and Kristin Persson filed in 2006 (Ceder is the co-inventor of the patent).