Published on *The National Law Review* https://natlawreview.com

Battery Currents Advanced Energy Storage – Michigan Update - October 31, 2012

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Aiming to Lessen Use of Rare Earth Metals

Ford Motor Company has decided that its third generation hybrid vehicle system will replace nickelmetal-hybrid batteries with lithium-ion batteries. This could reduce the company's use of "rare earth" metals such as neodymium, cerium, lanthanum, and praseodymium, by up to 500,000 pounds per year. The company has already reduced its use of dysprosium by about 50 percent in magnets for its hybrid vehicles.

Overheating in Electronic Vehicle Testing

Chrysler Group has suspended its testing of 109 pickups with plug-in hybrid powertrains due to batteries overheating in three vehicles. The Ram 1500 vehicles have a liquid-cooled 12.9 KWh lithiumion battery pack, 6.6 KW on board charger, and 5.7 liter Hemi V-8 engine that can shut down fuel delivery to up to four cylinders. A different battery chemistry will be used in the project's next phase before the vehicles are returned to service. No similar issues were reported with the 23 prototype plug-in hybrid minivans, which will also receive a battery upgrade.

Nanophosphate Lithium Ion Battery All Electronic Vehicle

General Motors has been testing prototypes of the Chevrolet Spark EV in high temperature locations. The Spark's nanophosphate lithium-ion batteries operate at peak efficiency in moderate temperatures, so GM has designed a battery heating and cooling system. With an expected 80-mile range, the all-electric Spark will be in showrooms in 2013. The 114 horsepower 85 KW motor will be built in Maryland; the batteries will be built in Michigan; and the car assembled in South Korea.

GM to Improve Electric Vehicle Range

Envia Systems of Newark, California, in collaboration with General Motors, has increased the amount of energy a lithium-ion battery can hold. GM has stated it will take a vehicle up to 200 miles on one charge within a couple of years. The new technology will cut battery costs in half. GM Venture LLC invested $17 million in Envia in 2011.

Salt Batteries on the Horizon?

A National Science Foundation grant to Michigan Technological University will allow research into the feasibility of sodium batteries. With sodium atoms about 70 percent larger than lithium atoms, the impact on a battery's electrodes is an issue. The Mich Tech project will use a transmission electron microscope to study how a sodium battery would charge or discharge at the atomic scale level.

Infrastructure for PEVs and EVs

The Plug-in Ready Michigan Plan is due out this fall. It is being prepared by The Clean Energy Coalition which has received DOE funding. Partnering with Next Energy, Greater Lansing Clean Cities and 40 other stakeholders, the goal is to develop and support community planning for plug-in electric and electric vehicles by identifying barriers and opportunities relating to planning, zoning, building codes, permitting, and utilities for charging infrastructure.

Eaton Works on Battery Management

Eaton Corp. is developing a cost-effective power control system to reduce the size of lithium-ion batteries without loss of battery life or vehicle performance. The goal is to reduce the size of the battery in an electric vehicle by 50 percent. The $2.8 million project will be led by Eaton's Innovation Center team in Southfield. This technology may be important for other areas where hybrid power management requires extended battery life: infrastructure, data centers, manufacturing.

A123 Files Bankruptcy; JCI to Buy Auto Assets

Filing for bankruptcy protection on October 16, A123 Systems, Inc. has already sold its automotive assets. Auto parts maker Johnson Controls will buy the automotive business for $125 million. This may allow Johnson Controls to fulfill A123's battery contracts with General Motors, BMW, Fisher Automotive, and others. Of the initial $249 million grant to A123 from the Department of Energy which required matching funds, about $129 million has been drawn down. Johnson Controls will take over factories in Michigan, cathode ray factories in China, and an equity interest in a Chinese battery company. A123 is now in talks to sell its grid, commercial, government, and other operations that were not purchased by Johnson Controls.

Faster Introduction of Electric Fords

Ford Motors has announced it will be introducing electrified vehicles 25 percent faster than previously planned. It will be investing $135 million in the design, engineering, and production of key components, including advances battery systems for its next generation hybrid electric vehicles, and is dedicating a 285,000 square foot R&D lab in Dearborn to focus almost entirely on hybrids. The goal is to reduce hybrid vehicle cost by 30 percent.

Holland Batteries to Power Fleet Vehicles

XL Hybrids has contracted with Johnson Controls to supply lithium-ion battery packs for hybrid power trains in light-duty vehicles used by commercial fleets. The ten-person start-up already provides hybrid electric powertrains for the Chevrolet Express and GMC Savana vans. The spiralwound lithium nickel cobalt aluminum cells will have 1.8 KWH of energy storage. The battery pack is being developed at JCI's Holland, Michigan, manufacturing facility.

Rechargeable Battery Giant Dies

Stanford R. Ovshinsky died this month, and is being remembered for his many technological contributions, including work that has led to the development of: paper-thin solar energy laminates that produce electricity even on a cloudy day; a field of electronics that has led to flat screen TVs, rewritable CD and DVD discs; hydrogen fuel cells; and nonvolatile phase change memory. [He founded Energy Conversion Devices in 1959, with the goal of using science and technology to solve the world's environmental and social problems.] But the work that has put his genius into almost every household in the country (and beyond) is developing the current version of the nickel-metal hydride (NiMH) battery with its wide ranging applications, including laptop computers, digital cameras, cell phones and hybrid vehicles. The first consumer grade NiMH cells for small applications appeared on the market in 1989, the culmination of over two decades of research and development by labs around the world. Ultimately, it was Ovshinsky's Ovonic Battery Co. in Michigan that altered and improved the alloy structure and composition under its patents, and which licensed NiMH battery technology to over 50 companies worldwide. Now as a mature technology, more than 2 million hybrid cars are running with NiMH batteries, and in the EU and due to the Battery Directive, Nickel–metal hydride batteries have virtually replaced Ni–Cd batteries for portable use by consumers.

National Law Review, Volume II, Number 314