Technology & Commerce!

Two organisations working on Nickel Manganese Cobalt chemistry cells.

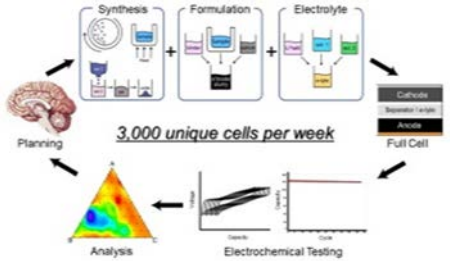
Batteries2020 Lithium-Ion Batteries

An 8.4-million-euro ($11-million) European research project called Batteries2020 aims to increase the lifespan and energy density of large-format automotive Li-ion batteries.

The project is scheduled to run through September 2016, by which time the group's goal is to have a commercialization-ready product that achieves a 4,000-cycle lifetime at 80% depth of discharge, and an energy density of 250 Wh/kg.

IKERLAN, a non-profit research center located in the Basque region of Spain, is coordinating the project, and partners include firms from Germany, Italy, Switzerland, Denmark and Belgium that have a wide range of expertise in materials development and battery production.

The team plans to improve cathode materials based on nickel/manganese/cobalt (NMC) oxides, as it believes that these materials have a good chance to be up-scaled and commercialized in the short term. It will start with existing state-of-the-art cells, and develop two improved generations of NMC materials, with the goal of improving performance, stability and cycleability. The project will study aging phenomena and degradation processes, and will also evaluate the potential of reusing and recycling batteries.



Wildcat Technologies

Wildcat Discovery Technologies in conjunction with Dow Kokam have been working on the latest cathode technologies such as lithium-rich nickel-manganese-cobalt (NMC). Different variations of Li-rich NMC are being explored by a lot of people and the problems with that material were the inspiration for this research. Wildcat state that they don't have a way to fix NMC's shortcomings, so instead they set out to develop a material with similar performance as Li-rich NMC, but without the voltage fade problem which this new compound has exhibited since being developed by Argonne National Labs. NMC generates a cell with a nominal voltage of 3.2 V but it experience a voltage fade as high as 400 mV over the first 1,500 cycles. So, Wildcat decided to start with a variation of the structurally stable material that exists after the voltage fade occurs. Basically, the resultant Li-rich NMC (CM3) is on par with the original in terms of performance, but is stable to structural conversion, so it doesn't experience any voltage fade.

The CM3 material has significantly higher energy density than any cathode material currently on the market, in excess of 250mAh/g, an increase of approximately 70 percent in gravimetric energy on a cathode basis. **So the chemists' dreams are being transformed into real EV power products. But it may be a few years before you can actually buy them!**

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ELECTRIC VEHICLE INTEREST GROUPS
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SP.01

The SP.01 will have a total weight of 1,068 kg, and it will be powered by a 150 kW electric motor mounted behind the passenger cabin that delivers 225 Nm of torque. The electric motor drives the rear wheels via a four-speed manual transmission; the normal Lotus fifth and sixth gear ratios in the gearbox are redundant but available as an option. Top speed is 249 km/h with a 0 to 100kmh time of 3.7 seconds, the same as the Tesla Roadster. The Detroit will have a 37 kWh lithium-polymer battery pack capable of delivering a range of 290 km under the New European Driving Cycle (NEDC) standard.

A 7.7 kWh home charging unit will fully charge the car in 4.3 hours, with the neat feature that the charger can supply power to the home if the mains go out as per Japan's version of the LEAF.

Read more:
http://www.detroit-electric.com

Detroit Electric

Err; is this a new Tesla Sports or not? Well actually it's a Detroit Electric. Yes, it is based on the Lotus Elise, as is the Tesla but is in fact a completely new vehicle that characterises the rebirth of the iconic Detroit Electric originally produced from 1907 to 1939. The original EV's were favoured by women and Doctors who required the instantaneous start, unlike the ICE vehicles of the time that had to be hand cranked. Some famous devotees of the marque were Clara Ford (Henry Ford's Wife), J.D. Rockefeller Jr. and Thomas Edison.

In 2008 Albert Lam, former Group CEO of the Lotus Engineering Group and Executive Director of Lotus Cars of England, obtained the rights to the Detroit brand name. Detroit Electric was re-launched to the world on 19 March 2013, with the signing of its new headquarters in the Fisher Building in Detroit, Michigan. The current model, tagged SP.01 is being constructed in Europe with a limited run of 999 vehicles. However, when production starts in earnest at the Wayne Michigan plant numbers are expected to hit 2500 vehicles per year.

C-X75 Details

What!! No Turbines??

The Jaguar/Williams team was satisfied with the performance and dynamics of the C-X75, but because there are no current production plans, finishing touches such as regenerative braking aren't enabled. Recharging the batteries of the 5 prototypes requires plugging into an electrical outlet.

The transverse-mounted seven-speed gearbox is super compact so much so that to save space and weight, it has no reverse gear; rearward movement is provided by reversing the rotation of the rear electric motor packaged mounted alongside the transmission. The front-mounted electric motor, which drives through an open differential, has a fixed ratio equivalent to the seventh speed of the gearbox.

During the development phase more than 100 patents have been applied for, most concerning the high-voltage side of the hybrid system. Jaguar's work with Williams continues. The partners already have a dedicated research section for hybrid powertrains that will launch a diesel-electric version of the Range Rover later in 2013 and expects to have "performance hybrid" Jaguars in its future model range. Did I mention price – well if the C-X75 did ever make it to the dealerships the estimated price would be $1,400,000US. Maybe a Prius would do after all!!

Jaguar C-X75 2013 Update

We had a look at the Jaguar C-X7 when it first appeared on the motor show circuit in 2010, back then it boasted of being a diesel fired, dual gas turbine hybrid EV.

The current iteration of the vehicle has had the turbines replaced with a Williams F1 designed 1600cc four cylinder with mechanical supercharger and exhaust driven turbo charger with direct and port fuel injection, gear-driven camshafts, variable valve timing, and dry-sump lubrication producing 500bhp at an astounding 10,000rpm. All up the C-X75 has 890bhp, and 1000Nm torque with two 195hp electric motors providing drive to the front and rear axles augmenting the petrol engine's rear wheel drive.

A race-car-style carbon-fiber monocoque chassis envelops a 19-kWh lithium-ion battery pack and a fuel tank, forming the center tunnel.

The performance targets: 0 to 100 mph in fewer than six seconds, a top end of more than 200 mph, and a CO^2 figure in the official EU test cycle below the 89g/km rating of the Toyota Prius. (You must admit it is prettier than a Prius too!) –

Car and Driver says:-

A lap of Jaguar's twisty Gaydon handling track in prototype No. 3 in 100% electric mode at speeds of up to 100 mph demonstrated seamless power delivery and a nimble character that would be easy to live with. Switching to the parallel mode revealed a completely different animal. Ferocious acceleration was accompanied by the wail of a highly tuned race engine, running up to 10,000 rpm between fingertip shifts of the seven-speed automated manual transmission. The C-X75 felt solid and reassuringly stable even near maximum speed 220mph! The deployable wing is said to generate 220kg of down force at 200 mph.

The Shape Of Things to Come!!

Volkswagen – XL1

This is the latest in high efficiency (262MPG) hybrids from VW, the XL1 is an electric/diesel combo that is all carbon fibre, aluminium and magnesium in construction. If you need a vehicle that is super-efficient with sparse options (no radio, no power steering and definitely no power windows) then the XL1 is for you. In the same tone there are no rear view mirrors inside or out, instead there are several cowled micro cameras that are viewed on a set of dash displays. Combined with the highly flowing body design and mountain bike style wheels and tyres, this car has an astonishing coefficient of drag (CD) of 0.189. Weighing in at 800Kg – some 530Kg lighter than a Prius the XL1 is certainly ticking all the right boxes when it comes to efficient design. Electric only drive can provide 50km range at 100kmh, hybrid mode with the 2 cylinder 47HP diesel can get you up to 150kmh & 500km further. A full recharge takes a mere one and a half hours. Only 250 units are being built with 50 currently being trialled; the vehicle itself is not for sale but design aspects are destined for inclusion into future projects.

This Month's Technology Review

To augment those wonderful LiFeP4 cells; particularly at take-off you really could do with a set of super capacitors to give that edge in performance as well as battery longevity. IOXUS manufacture a range of individual Ultra capacitors as well as modules, individual caps range in value from 100 to 3000 Farads all with an operating voltage of 2.7V. Modules are available in voltages from 16V to 216V with the EV useful options coming in at 54V @ 62 F – 8Kg, 108V @ 11.4 F – 10Kg, 162V @ 3 F – 7Kg, 189V @ 3 F – 7Kg and 216V @ 2 F – 10Kg. These UltraCaps can be cycled 500,000 times. A selected range is available through Mouser Electronics - http://au.mouser.com/ioxus/

Price for the 162V- 3F = $5529.64